





QK  
1  
S664  
c.2  
SI-Ref.

# Flora of the Marquesas, 1: Ericaceae–Convolvulaceae

MARIE-HÉLÈNE SACHET



## SERIAL PUBLICATIONS OF THE SMITHSONIAN INSTITUTION

The emphasis upon publications as a means of diffusing knowledge was expressed by the first Secretary of the Smithsonian Institution. In his formal plan for the Institution, Joseph Henry articulated a program that included the following statement: "It is proposed to publish a series of reports, giving an account of the new discoveries in science, and of the changes made from year to year in all branches of knowledge." This keynote of basic research has been adhered to over the years in the issuance of thousands of titles in serial publications under the Smithsonian imprint, commencing with *Smithsonian Contributions to Knowledge* in 1848 and continuing with the following active series:

*Smithsonian Annals of Flight*  
*Smithsonian Contributions to Anthropology*  
*Smithsonian Contributions to Astrophysics*  
*Smithsonian Contributions to Botany*  
*Smithsonian Contributions to the Earth Sciences*  
*Smithsonian Contributions to Paleobiology*  
*Smithsonian Contributions to Zoology*  
*Smithsonian Studies in History and Technology*

In these series, the Institution publishes original articles and monographs dealing with the research and collections of its several museums and offices and of professional colleagues at other institutions of learning. These papers report newly acquired facts, synoptic interpretations of data, or original theory in specialized fields. These publications are distributed by mailing lists to libraries, laboratories, and other interested institutions and specialists throughout the world. Individual copies may be obtained from the Smithsonian Institution Press as long as stocks are available.

S. DILLON RIPLEY  
*Secretary*  
Smithsonian Institution

Flora of the Marquesas,  
1: Ericaceae-Convulvulaceae

*Marie-Hélène Sacht*

ISSUED  
OCT 2 1975



SMITHSONIAN INSTITUTION PRESS

City of Washington

1975

## ABSTRACT

Sachet, Marie-Hélène. Flora of the Marquesas, 1: Ericaceae–Convolvulaceae. *Smithsonian Contributions to Botany*, number 23, 34 pages, 1 figure, 1975.—This is the first installment of a vascular Flora of the Marquesas Islands (French Polynesia). It contains floristic taxonomic treatments, keys, synonymy, descriptions, distribution, ethnobotany including uses and vernacular names, citations of geographic records, and herbarium specimens of the families Ericaceae, Epacridaceae, Myrsinaceae, Primulaceae, Plumbaginaceae, Sapotaceae, Oleaceae, Loganiaceae, Gentianaceae, Apocynaceae, Asclepiadaceae, and Convolvulaceae. A brief introduction outlines the history of the botany of the Marquesas, the materials on which the flora is based, problems in interpreting and using some of the collections, the climatic and geographic setting of the Marquesan Archipelago, and acknowledgments. Other families will follow in future installments as they are completed.

OFFICIAL PUBLICATION DATE is handstamped in a limited number of initial copies and is recorded in the Institution's annual report, *Smithsonian Year*. SI PRESS NUMBER 5265. SERIES COVER DESIGN: Leaf clearing from the katsura tree *Cercidiphyllum japonicum* Siebold and Zuccarini.

---

### Library of Congress Cataloging in Publication Data

Sachet, Marie-Hélène

Flora of the Marquesas.

(Smithsonian contributions to botany; no. 23)

Bibliography: p.

Supt. of Doc. no.: SI 1.29:23

CONTENTS: 1. Ericaceae–Convolvulaceae.

1. Botany—Marquesas Islands. I. Title. II. Series: Smithsonian Institution. Smithsonian contributions to botany; no. 23.

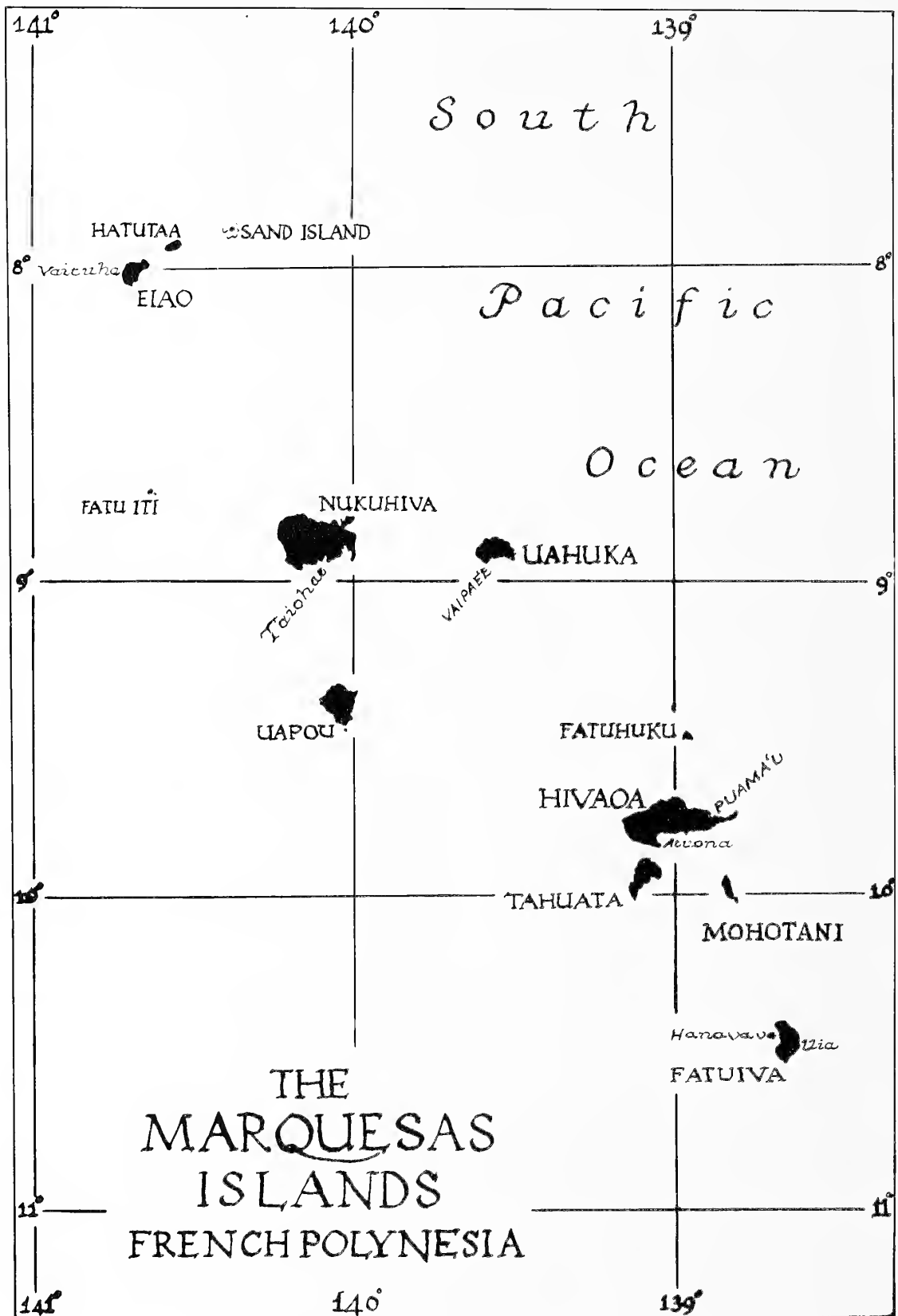
QK1.S2747 no.23, etc. [QK473.M35] 581'.08s [581.9'96'31] 74-30425

---



## Contents

	<i>Page</i>
Introduction .....	1
Ericaceae .....	5
Epacridaceae .....	6
Myrsinaceae .....	7
Primulaceae .....	11
Plumbaginaceae .....	12
Sapotaceae .....	13
Oleaceae .....	14
Loganiaceae .....	17
Gentianaceae .....	18
Apocynaceae .....	19
Asclepiadaceae .....	26
Convolvulaceae .....	27
Literature Cited .....	34



# Flora of the Marquesas, 1: Ericaceae-Convulvulaceae

*Marie-Hélène Sachet*

## Introduction

The Marquesas ( $7^{\circ}50'-10^{\circ}35'S$ ,  $138^{\circ}25'-140^{\circ}50'W$ ) are one of the eastern peripheral island groups in the Pacific Polynesian Triangle. The other major high island archipelago on the eastern edge of the island-strewn central Pacific, Hawaii, has one of the most interesting and remarkable floras in the world. It has received an enormous amount of attention and, while not yet fully known, is one of the best documented tropical floras. The Marquesas were discovered by Europeans almost 200 years earlier than Hawaii (or Tahiti), but their flora has remained one of the more inadequately studied of insular floras.

The Marquesas are less isolated than Hawaii and are only about one-third as high in elevation. Their area is less than 10 percent that of the Hawaiian group. The flora is smaller and the degree of endemism less. How much smaller and how much less than the Hawaiian 95 percent endemic is not known. The total land area is only about 1275 km<sup>2</sup>, little larger in aggregate than the islands of Tahiti and Moorea together. Distances are approximately 750 nautical miles to Tahiti, about 1900 to Hawaii, and 3000 to the Galapagos Islands.

Like the Hawaiian and Society islands, the Marquesas are high volcanic islands. Unlike the others, especially Tahiti, they lack a coastal plain and almost completely lack coral reefs. Lowland areas occur only at the mouths of rivers. The islands rise abruptly from the ocean in dark steep forbidding

cliffs with scattered shrubs and vines clinging here and there. The two largest islands are also the highest, Nukuhiva (1185 m) and Hivaoa (1260 m). The volcanic masses soar to narrow steep crests, which form the backbones of the islands. The slopes below these long ridges are often eroded into cirques surrounded by precipitous slopes and cliffs, and narrowing downward into canyon-like valleys. After a break in slope, the gentler relief of some of the interfluves, occasionally broad and rather flat-topped, gives the impression of sloping, dissected plateaus ending abruptly at the coast with a sudden drop. Elsewhere, sharp and narrow ridges tumble seaward. Nukuhiva has a broad elevated interior basin with boggy areas, called the Tovii, which has certainly not been completely explored for plants. The island of Uapou is crowned with tall spires of phonolitic trachyte.

There are small steep desert islands in the group and a sand islet on a coral bank, of which very little is known.

The climate of the region is tropical oceanic, constantly warm, with high atmospheric humidity, local sporadic rain showers, and heavy orographic rainfall where the mountainous islands interfere with the prevailing easterly trade winds. However, the simple pattern of windward-leeward trade-wind effect in the Marquesas is very much complicated by the dissected topography and other factors. The "backbones" of the islands are usually bathed in mists and crowned with very mossy "cloudforest." But on low lying areas, the trade winds exert a desiccating effect. The lower uninhabited islands, the "desert" islands, appear quite arid and there are years of prolonged drought. On the western

---

*Marie-Hélène Sachet, Department of Botany, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560.*

"plateaus" of Nukuhiva and Hivaoa stretch arid areas, with a vegetation of grasses and scattered woody plants, including very interesting species, such as sandalwood and *Cordia lutea*, a shrub otherwise known from dry Ecuador, Chile; and the Galapagos Islands. The deep valleys contain streams, many of which are frequently dry; and the high waterfalls tumbling down the cliffs of the higher cirques often disappear.

In Atuona, on Hivaoa, masses of cool air may flow down the slopes at night and chill the village to a surprising degree. The overall picture is that, with a relatively uniform temperature and atmospheric humidity, there is great and quite unpredictable variation in rainfall (except perhaps for the crests) and a mosaic of local climates. The pattern is much less orderly and predictable than on Tahiti, for instance.

Hurricanes are unknown in the Marquesas, but tsunamis of the South Pacific have often caused extensive flooding of the small alluvial plains at the valley mouths, where the modern villages are usually located, creating extensive destruction and loss of life and crops.

A more detailed description of the geography and vegetation will be omitted at this time, because little information has become available since the work of Adamson (based in part on LeBronnec's field work), Aubert de la Rüe (1958), Decker (1970), and others. Sachet and Fosberg (1955, 1971) include references on Marquesan vegetation. More field work is in progress or planned, and it should provide much additional material for a later detailed account of Marquesan nature. The flora is also receiving renewed attention, and later parts of this series will surely reflect this welcome interest in the Marquesas.

The Marquesan flora was included in the French Polynesian flora of Drake del Castillo (1892), as well as in his partially completed Illustrated Flora of the Pacific Islands (1886-1892), both of which were based on what casual collections were available to the author. Forest B. H. and Elizabeth D. W. Brown spent 17 months in the Marquesas on the Bayard Dominick Expedition in 1921-1922 (Brown, 1931:3-9). With more experience and better support in the field, they could have, in the amount of time available, gathered materials for a flora adequate for reasonable phytogeographic statistical comparison, at least if the accumulated

material in the Paris herbarium had been included. While the Browns made reasonably good collections of the lowland flora on several of the larger islands, some of the smaller islands and most of the high mountains on the larger ones were very inadequately covered. Relatively small collections made since have yielded some remarkable finds and a high percentage of novelties (Fosberg, 1939; Fosberg and Sachet, 1966, 1975).

F. Brown's Flora of Southeastern Polynesia (1935) is essentially a report on the plants collected on the Bayard Dominick Expedition by the Browns, on the Whitney Expedition by Quayle, Jones, and R. Beck, and by the Pacific Entomological Survey. Earlier collections not represented in the Bernice P. Bishop Museum herbarium were not included, except as they may have been recorded by Drake del Castillo. In addition, the work suffers from erratic writing and non-existent editing. There are glaring errors in identifications; under some species, full descriptions and specimen citations are included, elsewhere they are casual or partial, or absent altogether. Nevertheless, up to now, this work has remained the *only* modern flora available for French Polynesia, and has been very useful to many.

Martin L. Grant had accumulated in catalog form a tremendous amount of data on French Polynesia, centered on the Society Islands to be sure, but including the Marquesas as well, and his files are available to us. None of his work was published during his life-time and only a few families have recently been treated in print for the Society Islands (Grant, Fosberg, and Smith, 1974).

The inadequacy of F. Brown's work, added to the fact that a number of collections have been made during the last 40 years, make a new flora of the Marquesas an important desideratum, even though the extensive additional field work needed has not yet been possible.

The series of papers initiated by the present one is planned to fill, to some extent, this gap in modern knowledge of Polynesian floras. It is based on materials studied in the Bernice P. Bishop Museum, the University of California at Berkeley, the New York Botanical Garden (especially the plants of J. G. Chapin), the Brooklyn Botanic Garden, and on my own collections and those of Bryce G. Decker, to be deposited in the U.S. National Herbarium, on duplicates received by this herba-

rium from George W. Gillett, and on small but choice collections received for identification from Francis Hallé and Henri Lavondès. Of special importance are the historical collections examined in the Laboratoire de Phanérogamie, Muséum National d'Histoire Naturelle, Paris; at the British Museum (Natural History), and Kew. These 18th and 19th century collections from the Marquesas (and from other Pacific island groups) have often been ignored in early 20th century work on the Pacific floras, as in F. Brown's work on southeastern Polynesia. In Paris, especially, lack of staff and emphasis on other parts of the world have resulted in such specimens not being readily available for study, especially to workers in Honolulu and other American centers who could not easily travel to European institutions. Because I have been able to spend some time in Europe, though not nearly enough as yet, the present flora suffers less from inadequate attention to these historical collections.

Starting with the Forsters on Captain Cook's second voyage in 1774, a number of European visitors, many of them French Navy surgeons or pharmacists, gathered plants in the Marquesas, on which the earlier described species were based, as were Drake del Castillo's treatments. Prominent among these were Bennett in 1835, Hinds and Barclay in 1840, Dupetit-Thouars in 1838 and 1842, Hombron and Le Guillou in 1836, LeBatard in 1844, Mercier in 1847, Jardin in 1854–1855, Lenormand in 1857, and Savatier in 1877. I have not seen the collections made by Langsdorff in 1804 during the Russian around-the-world expedition under Krusenstern.

Unfortunately, as is the case with so many early collectors' notations, the herbarium labels are often deficient or difficult to decipher or interpret. The collections were separated early and labeled by the owners of large private herbaria, so that duplicates of a collection may bear different labels. Dates given are often those of receipt in the herbarium rather than that of actual gathering.

The precision needed to satisfy modern requirements for typification of species is not always easy to achieve. I hope that in this respect the present flora may make a substantial contribution.

The 20th century specimens present less problems than the earlier ones and are usually numbered consecutively and clearly labeled and dated, although some include very little data. One of the

most important collections, however, that of the Pacific Entomological Survey, offers complications. I worked on it in 1963 in Atuona and have studied the plants in other herbaria since then, so I will describe its history in some detail.

The Pacific Entomological Survey, under the aegis of the Bishop Museum, sponsored insect collecting expeditions in various Pacific Island groups, the most important such project being that in the Marquesas, which lasted from January 1929 to January 1932. A summary of this work, as well as a description of the archipelago, is given by A. M. Adamson (1936), one of the two entomologists of the party. The director of the party was E. P. Mumford, and together they stayed in the Marquesas until April 1930. In addition to insects and other small invertebrates, host plants were collected, mostly by Adamson and the local assistants, the principal one of whom was the Frenchman G. LeBonnec (Sachet, 1966). Together, Adamson and LeBonnec collected over 600 numbers and, after the departure of the entomologists, LeBonnec and the other assistants continued to gather insects and plants. The main collection was sent to the eminent botanist, E. D. Merrill, then Consulting Botanist for the Bishop Museum. In record time, he sent back to the Marquesas lists of preliminary identifications from Berkeley and later New York. The main collection was then distributed by Merrill. Some confusion arose at that point: All the specimens carried Bishop Museum field labels with the heading "Pacific Entomological Survey" and laboriously typed in the Marquesas in multiple copies. The actual collectors were not mentioned. In the Bishop Museum, where the main set is deposited, herbarium labels were prepared that include some of the data from the field labels and cite the collectors as Mumford and Adamson, as in Merrill's lists of identifications. An important set remained in Berkeley, with herbarium labels prepared by Merrill, the collectors being cited as Mumford and Adamson, and little or no data included from the field labels, which therefore provide essential data when mounted on the sheets. The same is true of the partial set sent from Berkeley to the New York Botanical Garden, and of the plants received later in New York. However, some Berkeley duplicates and most New York ones are labeled "Adamson and Mumford." There are small numbers of the Pacific Entomo-

logical Survey plants in other herbaria; and the partial set retained by LeBonnec (unlabeled, except for copies of the field labels) is now in my hands for study and will eventually be turned over to the herbarium in Paris, or at least that part of it that has not suffered too much from insect damage and other vicissitudes.

With his preliminary lists, Merrill sent advice on improving the collections and requests for additional material of sterile or inadequate specimens. After the departure of the entomologists, LeBonnec attempted to recollect the desired material, and numbered his collections "Ex 2" meaning extra material of no. 2. Starting in October 1930, he tried to find the same species again and, on the whole, succeeded remarkably well. Merrill did not see these collections, and in the Bishop Museum they were labeled "Pacific Entomological Survey." There are other complications which need not be detailed here, but which have led me to decide that this major Marquesan collection should be cited in a uniform way, especially in a flora. As on the field labels, the collectors will be mentioned as "PES" (Pacific Entomological Survey), followed in parentheses by "M & A" (Mumford and Adamson), or "A & M" (Adamson and Mumford), or whatever collectors' names are on the herbarium labels. Since my return from the Marquesas in November 1963, I have taken every opportunity to examine specimens of this collection in Honolulu, Berkeley, and New York, and I now have a fairly complete catalog of it, which I plan to publish at a later date.

The synonymy given in most cases is not exhaustive, but includes those names used in the literature on the Marquesas and neighboring islands, basionyms of accepted names, and what other names are useful in interpreting the usages adopted in earlier works. The references given in the synonymy, likewise, are only those needed to document the names listed and those that were sources of information incorporated into this paper. All references have been verified. Free use has been made of all published sources available, of the documents and manuscript notes accumulated over 50 years of residence in the Marquesas by G. LeBonnec, as well as of data recorded on herbarium labels and in my own notes.

Herbarium symbols accompanying citations are those of *Index Herbariorum*, edition V, 1964, with

the addition of "Fo," indicating specimens still undistributed by F. R. Fosberg and myself and "LeB" for the LeBonnec set of the Pacific Entomological Survey collection. Abbreviations used very frequently in synonymy are as follows: F. Brown, Flora (F. Brown, 1935); Drake, Flore (Drake del Castillo, 1892); and Drake, Ill. (Drake del Castillo, 1886-1892).

Like other island groups in the Pacific, the Marquesas were "discovered" on repeated occasions and given sets of Spanish, French, and English names in addition to their Marquesan names (Brigham, 1900:184; Jourdain, 1970). The latter are rendered with a variety of spellings depending on the nationality of the person or his knowledge of Polynesian languages. In this series of papers on the flora, the simplest spellings of the Marquesan names (Figure 1) will be used throughout, with the name as listed on the label added only when there might be some confusion. Marquesan is one of the Polynesian languages and includes at least two principal dialects: the northwest dialect of Nukuhiva and Uahuka and the southwest one of Hivaoa and Fatuiva. The main differences in pronunciation are that "k" in the northwestern dialect becomes "n" in the southeastern dialect (thus "Uahuka" is called "Uahuna" in the southern islands), and "h" (NW) is replaced by "f" (SE). There are also some cases where quite different words are used for the same thing, on different islands, and this is true of plant names. All Marquesans know Tahitian to a certain extent, and many ornamentals or other plants brought from Tahiti often retain their Tahitian names.

Of all the plant collectors who have worked in the Marquesas, few knew Marquesan. The only one who has some critical knowledge of Marquesan linguistics is Henri Lavondès, who collected a few plants in 1966. LeBonnec had good Marquesan informants, but he had to render the sounds as best he could, or following missionary usage. I will cite the names as given on herbarium labels or in books, with occasional comments when I know them to be in error. Altitudes are listed as they appear on the labels, with approximate metric conversions supplied in brackets where necessary. Such figures mean little except as very general orders of magnitude, as few botanists carry altimeters and there are no topographic maps of the Marquesas.



Indebtedness to the authorities and staffs of the institutions where I have worked and who have loaned specimens to me is gratefully acknowledged. I wish to express my appreciation especially to the Bernice P. Bishop Museum, where I am always made to feel at home, as at the Botany Department of the University of Hawaii, and to my friends and colleagues in Paris, who, year after year, have helped me track down 18th and 19th century collections and documents. In the Marquesas, I salute the memory of a great born-naturalist, G. LeBronnec, with whom I worked every day for many weeks, and acknowledge the good-natured help of his family. In Tahiti, the former Service de l'Agriculture, the French overseas research office, ORSTOM, the representatives of the Paris Muséum d'Histoire Naturelle and, of course, the governor's office and other branches of the government, all gave me support, advice, and help during my visits.

Outstanding has been the help of my dear friends Jean-Noël and Nora Maclet, who are still growing some rare Marquesan plants in their beautiful hillside gardens above Papeete and helping me in many different ways.

In starting this series of papers on the Marquesan flora, I wish to recognize the help of Dr. F. R. Fosberg, whose assistant I was for many years and who introduced me to Pacific studies and taught me a great deal. Perhaps most important, as a senior colleague, he has always provided me with moral support and encouragement, as well as advice, when needed.

## ERICACEAE

Shrubs, subshrubs, herbs or rarely trees; leaves usually alternate, simple, exstipulate, usually more or less serrate or dentate; flowers bisexual, solitary or more usually in spikes, racemes or racemose panicles; calyx of 4–7, usually 5, variously connate sepals; corolla of the same number of petals, free or usually united, often urceolate; stamens twice the number of corolla lobes, rarely the same number, usually free, filaments rarely more or less united, anthers often appendaged, cells opening by terminal pores or slits; pistil 1, ovary superior or inferior, cells 4–10, usually 5, placentation axile, ovules usually many, occasionally as few as 1 in a cell, style 1, often curved; fruit a capsule or berry;

seeds usually small, and numerous, rarely few and larger.

A large nearly cosmopolitan family. One genus in the Marquesas.

### *Vaccinium* L.

*Vaccinium* L., Gen. Pl., ed. 5, 166, 1754 [= 1753].

Shrubs, dwarf-shrubs, rarely small trees; flowers usually axillary, solitary, or in small clusters; corolla typically urceolate, rarely campanulate or rotate, gamopetalous; anthers variously appendaged; ovary inferior, with many ovules; fruit a berry with many seeds, in many species edible.

Taken in a broad sense, an almost cosmopolitan genus, especially in cool or mountainous regions. One species in the Marquesas.

The genus *Vaccinium* is commonly represented in the higher regions of Polynesia, as well as in other Pacific islands. In southeast Polynesia, with the exception of *V. rapae* Skottsberg described as endemic in Rapa, all the island plants have commonly been referred to *Vaccinium cereum* (L.f.) Forster sensu lato, described from Tahiti.

### *Vaccinium cereum* (L.f.) Forster f.

*Vaccinium cereum* (L.f.) Forster f., Prodr., 28, 1786.—Skottsberg, Acta Hort. Gothob., 8:87, 91–97, 1933.  
*Andromeda cerea* L.f., Suppl., 238, 1781.

Small shrub, branchlets and leaf-bases somewhat puberulent to glabrous; leaves oval to broadly obovate, up to 4 × 2.5 cm, very slightly to markedly shortly acuminate, margins minutely serrulate to subentire, blades stiff, reticulate-veined, petioles very short, thick; flowers on pedicels up to 8–10 mm long, with one or two bractlets near base; calyx lobes ovate, 2–3 mm long; corolla white, ovoid-urceolate, to 1 cm long, with 5 ovate lobes; anthers with 2 subulate erect or divergent appendages; fruit purple-black, with many angular seeds.

The type is from the Society Islands.

Skottsberg (1933) made a detailed study of this species, in which he recognized two varieties from Tahiti with two forms each and one variety from Rarotonga, and he referred the Marquesan *V. adenandrum* to var. *cereum* f. *eristemon* Skottsberg.

Forest Brown, on the basis of more material,

regarded the Marquesan plant as *V. cereum* var. *adenandrum*, which is the disposition adopted here. Certain Marquesan specimens, in their sharply serrate leaf margins and pubescent stems resemble more var. *cereum*. Evidence is insufficient to tell if they constitute a separate population or are merely aberrant individuals.

***Vaccinium cereum* var. *adenandrum* (Decaisne)  
F. Brown**

*Vaccinium cereum* var. *adenandrum* (Decaisne) F. Brown, Flora, 215, 1935.—Fosberg and Sachet, Smithsonian Contr. Bot., 21:1, 1975.

*Vaccinium adenandrum* Decaisne, Bot. Voy. Venus t.17, 1846; 23, 1864.

*Vaccinium cereus* sensu Jardin, Mém. Soc. Sci. Nat. Cherbourg, 5:296, 313, 1857.

*Vaccinium cereum* sensu Drake, Ill., 223, 1886 [1892]; Flore, 115, 1892 [pro parte].

*Vaccinium cereum* var. *cereum* f. *eriosomon* Skottsberg, Acta Hort. Gothob., 8:92–93, 1933 [pro parte].

Stems usually glabrous; leaves usually obscurely serrulate, broadly elliptic to broadly oblong or obovate; flowers glabrous, filaments prominently pilose.

Type from the Marquesas.

SPECIMENS SEEN.—Without locality, probably from the Marquesas, s.coll. no. 42 bis (US), the label says “*toatoa*,” which is the Marquesan name cited by Decaisne, so this sheet may be part of the type of var. *adenandrum*.

Marquesas Islands: *M. Henry* no. 19 (P); *Herbier S.F.I.M.* 168 (P).

Nukuhiva I.: *Le Batard* in 1844 (P, US); “point culminant des montagnes,” *Mercier* s.n. (P); *E. Jardin* in 1855 No. 101 (P); 3500 ft [1100–1200 m], *Seale* s.n. (BISH); *Tovii, Hallé* 2079 (US, P, MPU); *Tovii*, 1000 m, *F. Brown* 496A (BISH), 800m, *Quayle* 1222 (BISH); *To’ovi’i, Taupua’o’oa*, 800 m, *Decker* 2013 (US, Fo, UC); Mt. Tapua’ooa, 2 km from Tapua’ooa shelter, 3 km W of Mt. Ooumu, *Gillett* 2158 (US, BISH); Tapua’ooa, forest in cloud zone, 3100 ft [900–1000 m] *PES* (as *A* & *M*) 577 (NY sheet only).

Uahuka I.: 500 m? *Quayle* 1760 (BISH); 800 m? *Quayle* 1834 (BISH).

Uapou I.: Mt. Tekahoipu, 800 m, *Quayle* 1153 (BISH) (erroneously cited by F. Brown as from Fatuiva).

Hivaoa I.: *Feani*, 900 m, *F. Brown* 972 (BISH); 3700 ft, [1100–1200 m], *Clarke* HO8 (US); Atuona-Feani Trail, just below crest of ridge, 1200 m, *Sachet and Decker* 1140 (US, Fo, P, BISH); NE slopes of Mt. Temetiu, 700 m, *PES* (M & A) 27 (BISH, UC, LeB); N side of Mt. Temetiu, 1100 m, *PES* (M & A) 145 (BISH, LeB), Atuona, mountain side, 700 m, *PES*

*Ex27* (BISH); Vaina, forest, 700 m, *PES* (M & A) 429 (BISH, NY (as *A* & *M*), LeB).

Tahuata I.: *Hallé* 2177 (US, P, MPU).

Fatuiva I.: Omoa Valley, 800 m, *F. Brown* 1082 (BISH).

ETHNOBOTANY.—Jardin (101) gives the name “*heua* (Kanac)” from Nukuhiva, “*Kanac*” meaning here Marquesan (*heua* usually applies to *Metrosideros* sp. in Nukuhiva, and may have been recorded in error for *Vaccinium*). Decaisne gave the name *toatoa*, which is probably from the southern Marquesas. F. Brown (Flora) cited *hueki* from Nukuhiva, and *puatoatoa* from Fatuiva, and said the fruits are eaten in times of famine. LeBronnec (MS) tried to identify “*toatoa*” with the help of old Marquesans, whom he considered to be reliable informants. They could only report that they had heard it said that it was a plant of high regions, the seed of which was used in medicine.

**EPACRIDACEAE**

Shrubs or small trees; leaves alternate or spiral, usually stiff, small, veins subparallel, exstipulate; flowers usually bisexual, actinomorphic, pedicels often bracteate; calyx 4–6 lobed, persistent; corolla gamopetalous, 4–6 (usually 5) lobed, aestivation imbricate or valvate; stamens same number and alternate with lobes, attached on corolla or basally, often alternating with tufts of hair or glands, anthers 1-celled, dehiscing longitudinally; pistil 1, ovary superior, 1–10 celled, placentation axile, ovules 1 to many in a cell, style 1, stigma capitate; fruit a capsule or drupe.

Mainly Australasian, with scattered outliers in Polynesia, Micronesia, and Malesia. One genus in Polynesia.

***Styphelia* J. E. Smith**

*Styphelia* J. E. Smith, Spec. Bot. New Holland, 45, 1795.

*Cyathodes* Labillardière, Novae Holland. Pl. Sp., 57, 1804–06 [1805].

Ericoid shrubs; leaves rather crowded, small, stiff, entire; flowers axillary, pedicels with imbricate bracts; corolla short, tubular, lobes recurved or reflexed at least in age; fruit a rather mealy drupe.

A genus of many species, mostly Australian, some Melanesian, a very few Polynesian, one Microne-

sian. One variety of a Hawaiian species in the Marquesas.

***Styphelia tameiameia* (Chamisso & Schlechtendal)  
F. v. Mueller**

*Styphelia tameiameia* (Chamisso & Schlechtendal) F. v. Mueller, *Fragmenta*, 6:55, 1867.

*Cyathodes tameiameia* Chamisso & Schlechtendal, *Linnaea*, 1:539, 1826.

Leaves patent, broadly to narrowly elliptic, stiff, up to 1 cm long, dull green above, whitish with darker veins beneath, these forked once or twice and somewhat spreading distally; corolla white, 3 mm long, lobes triangular, pilose within, more or less hooked at apex; fruit subglobose to depressed globose white to purplish on one side or maroon.

A common Hawaiian species with several forms or varieties in southeastern Polynesia. In Hawaii the species occurs over a great altitudinal range and exhibits a perplexing array of variations that have yet to be elucidated. In the Marquesas, one variety very close to, but distinguishable from, the Hawaiian ones, is found at higher elevations on Nukuhiva.

***Styphelia tameiameia* var. *marquesensis* F. Brown**

*Styphelia tameiameia* var. *marquesensis* F. Brown, *Flora*, 218, 1935.

*Styphelia tameiameia* var. *tameiameia* sensu Sleumer, *Blumea*, 12:162, 1963.

*Styphelia tameiameia* f. *marquesensis* (F. Brown) Grant, Fosberg, and Smith, *Smithsonian Contr. Bot.*, 17:10-11, 1974.

Twigs densely short pubescent or puberulent; leaves oblong-elliptic 9-15 × 2-3 mm, leaf veins usually less forked than in var. *tameiameia*, outer ones forked one or more times, inner 1-3 quite parallel, some slightly forked once, rarely more times, bracts more strongly ciliate; flowers with corolla-lobes triangular-lanceolate, glabrous within; noticeably hooked; fruits usually red (e.g., *Decker 379*, *Brown 533*), rarely white to rose (*Decker 2014*).

In most respects within the range of variation of the Hawaiian forms, but with consistently long narrow leaves, narrower glabrous, hooked corolla lobes. Sleumer (1963:162), however, could not find

"any constant character to separate the Marquesas specimens from the Hawaiian forms."

In spite of Brown's rather confusing publication of this "form *marquesensis* F. Brown, new variety," it seems best cited as var. *marquesensis* F. Brown. Grant (Grant, Fosberg, and Smith, 1974:10) discussed this plant but found no distinguishing characters, so did not separate it from *S. tameiameia*.

Found only on Nukuhiva, at high altitudes, locally common in scattered localities. Fruit reported (*Brown 533*) to be eaten by "cuckoo," probably the "kuku," or Marquesan fruit pigeon.

SPECIMENS SEEN.—Marquesas Islands: s.l. *Henry 5* (P), *Henry* in 1919 (P).

Nukuhiva I.: *Tovii*, 900 m, *Brown 533A* (BISH, holotype), *533* (BISH, isotype), *533B* (BISH, isotype), *Quayle* (cited as *Quarles* by Sleumer) *1237* (BISH), *Hallé 2080* (US). *Tovii*, "hauts plateaux, rare," *Henry 41* (P); *Toovii*, below Mt. Ouumu, 3200 ft. [1000-1100 m], *Decker 379* (US, BISH), *Taupua'o'oa*, 800 m, *Decker 2014* (US, P, BISH, Fo), 5 km SW of *Tapua'ooa* shelter, 850 m, *Gillett 2191* (US, BISH), *Tunoapahuhitane* ridge, 3200 ft. [1000-1100 m], *Hambuechen (Decker's) 308* (US, BISH). *Maauu*, 3000 ft. [900-1000 m], *PES 560* (NY (as *A* & *M*), LeB).

ETHNOBOTANY.—Marquesan names: *puhatikiei* (*PES 560*), *ohopukei* (F. Brown, 1935).

## MYRSINACEAE

Vines, shrubs, and trees, often with dark glands, leaves simple, unlobed, usually alternate, exstipulate; flowers unisexual or bisexual, actinomorphic, solitary, in axillary fascicles, terminal or axillary cymes, racemes or panicles; sepals 4-6, separate or united at base, often reddish or black-punctate, persistent; corolla gamopetalous, tube usually very short, lobes 4-6, valvate or imbricate; stamens usually attached to the corolla, opposite the lobes, rarely connate, anthers 2-celled; pistil 1, ovary superior, rarely inferior, locules 1 or 4-6, ovules 1 to many, placentation free-central or axile, placentas complex, surrounding ovules; fruit fleshy, baccate or usually drupaceous, with 1 to few seeds.

Pantropical, with a few temperate zone species. One genus with several Marquesan species.

Until recently, only F. Brown (1935:219) had recognized the occurrence of this family in the Marquesas, and he cited under *Rapanea myricifolia* f. *marquesensis* all the material available to him. *R. myricifolia* Gray, however, does not occur in the Marquesas.

***Myrsine* L.**

*Myrsine* L., Gen. Pl., ed. 5, 90, 1754 [=1753].

*Rapanea* Aublet, Hist. Pl. Guiane, 1:121, 1775.

Small trees; leaves usually entire, rarely denticulate, sessile to short-petiolate, usually coriaceous or subcoriaceous, obscurely or clearly pinnately nerved, with or without a marginal nerve; flowers dioecious, axillary, solitary or in fascicles, usually borne below the leaves, pedicellate to subsessile, those of the 2 sexes similar except that the non-functional parts are smaller; calyx united at extreme base, sepals scale-like; corolla rotate, tube very short, lobes longer than tube, imbricate; stamens with anthers longer than filaments; pistil with superior ovary, 1-celled, ovule attached basally, style very short, erect, stigma peltate, sugar-loaf-shaped or ligulate; fruit a globose drupe with

thin flesh, stone globose, with one seed.

Pantropical genus, usually found in montane situations, of which most species have been called *Rapanea*. The differences between *Myrsine* and *Rapanea* are in shape of leaf, distribution on the stem, margin denticulate vs. entire, and ill-defined stigma differences. Until something more substantial is found, it seems best to recognize only one genus in this relationship. The Marquesan plants have all been previously referred to *Myrsine* (or *Rapanea*) *myricifolia*, which is a different Fijian species.

Study of recent collections led to the separation of several new species (Fosberg and Sachet, 1975). Because this is such a difficult group the original descriptions of the species are cited here in full. More collecting is very much needed (cf. Grant, Fosberg, and Smith, 1974:14).

**Key to Marquesan Species of *Myrsine***

1. Leaves sessile, stiff-coriaceous, base cordate.....*M. tahuatensis*
1. Leaves petiolate (petiole sometimes very short)..... 2
2. Leaves acuminate, less than 4.5 cm long, twigs very slender.....*M. gracilissima*
2. Leaves obtuse, rounded or acutish ..... 3
3. Petioles slender, less than 2 mm wide .....*M. adamsonii*
3. Petioles thick, over 2 mm wide ..... 4
4. Pedicels 2–3 mm long, leaves usually over 13 cm long, submarginal vein undulating and distinct .....*M. nukuhivensis*
4. Flowers and fruits subsessile, leaves usually less than 13 cm long, submarginal vein obscure .....*M. grantii*

***Myrsine adamsonii* Fosberg & Sachet**

*Myrsine adamsonii* Fosberg & Sachet, Smithsonian Contr. Bot., 21:4, 1975.

*Rapanea myricifolia* f. *marquesensis*, F. Brown, Flora, 219, 1935 [pro parte].

Rather slender shrub 3–4 m tall, glabrous, branchlets about 3 mm thick, cataphylls tightly wrapped around terminal buds, which are stoutly subulate, 4–5 mm long, leaves not especially crowded, blades broadly elliptic, rather thin, up to 10 × 4.5 cm, apex bluntly acute to obtusish, both surfaces obscurely but rather densely papillate-punctate, venation not prominent but distinct, main veins 16–20 on a side, variously spaced, rather widely divergent from a slender midrib, neither precisely parallel nor opposite, one or two fainter and shorter ones in most intervals, main ones

anastomosing about 3 mm from margin to form a somewhat undulating submarginal vein, network obscure, base acutish, slightly decurrent into a slender curved petiole 8–13 mm long; persisting dried flower 4-merous; calyx lobed nearly to base, lobes ovate, obtuse or appearing acutish because infolded with 1-several prominent black spots dorsally, margins thin, glandular, ciliate, lobes spreading in fruit; corolla with very short tube, lobes elliptic, to about 2 mm long, granulate ciliate; anthers narrowly ovate, blunt, apically papillate; stigma narrowly pyramidal, fleshy, about 2 mm long, 4-sulcate when dry; fruits on short thick pedicels about 1 mm long and thick, in clusters of 3–5 on very short tubercle-like inflorescences about 2–3 mm long, drupe globose or subglobose, up to 5 × 4.5 mm, surface when dry rugulose with a mixture of obscure pale and dark dots, crowned

with a broad disk-like very short style, and, until fairly mature, a subulate, sulcate, obliquely projecting stigmatic beak about 1 mm or so long, immature fruits with a subpersistent lanceolate-subulate, somewhat strap-shaped stigma over 1 mm long, caducous before complete maturity, fruit surface with somewhat obscure pale punctuation.

**SPECIMENS SEEN.**—Nukuhiva I.: s.l. *Quayle 1320* (BISH); 900 m, *Brown 496* (BISH); Tapuaooa, 3100 ft. [900–1000 m], fruit said to be purple, *PES (M & A) 577* (BISH, LeB, NY (as *A & M*)); Toovii Valley, 800 m, near the Tapuaooa shelter, *Gillett 2200* (BISH, US, type, P); Tovii, 1000 m, *Herb. S.F.I.M. 107* (P).

**ETHNOBOTANY.**—Nukuhiva name *kautai* (*S.F.I.M. 107*). LeBrouneq (ms) was never able to ascertain Marquesan names for this or any other species.

### *Myrsine gracilissima* Fosberg & Sachet

*Myrsine gracilissima* Fosberg & Sachet, Smithsonian Contr. Bot., 21:6, 1975.

Small, much-branched tree, foliage mostly at top, branchlets extremely slender, ultimate ones 1 mm or less thick, when older strongly lenticellate; cataphylls lanceolate, closely wrapped around terminal buds; leaves loosely scattered on branchlets, blades broadly lanceolate, up to 4.5 × 1 cm, sharply acuminate or even slightly caudate at apex, attenuate at base, margins somewhat revolute, crispate, venation very obscure, on young leaves faintly impressed above, main veins 8–10, at a small angle to the slender prominent midrib, network scarcely visible,

lower surface densely papillate-punctate, punctuation scarcely visible above, petiole very slender, 8–12 mm long; inflorescence, like a small globose scaly bud, axillary, about 1.5 mm across, very few flowering at this season, pedicels 1–2 from an inflorescence, slender, 2–3 mm long; staminate flowers 4-merous, calyx lobed about half way, lobes ovate, slightly acuminate, carinate; corolla tube very short, completely included, lobes about 2 mm long, oblong, cucullate, black-punctate dorsally, almost erect at anthesis, margins strongly papillate; anthers ovate or oval, about 1.5 mm long, dehiscent while corolla lobes are still not spreading, apex papillate, pistillate flowers and fruits unavailable.

**SPECIMENS SEEN.**—Hivaoa I.: Atuona-Feani Trail, ridge crest and top of leeward slope in cloud-forest, 1200–1300 m, *Sachet & Decker 1154* (US, type, P, Fo, K, MO, UH, A, BISH); North side of Mt. Temetiu, 1100 m, *PES (M & A) 148* (UC).

### *Myrsine grantii* Fosberg & Sachet

*Myrsine grantii* Fosberg & Sachet, Smithsonian Contr. Bot. 21:7, 1975.

Shrub or small tree, glabrous; leaves chartaceous to coriaceous, small to moderate sized, elliptic or obovate, veins not prominent; flowers subsessile in scaly-bracteate clusters of 3–5 (–7), bracts, calyx-lobes and corolla-lobes glandular-ciliolate; anthers sagittate, apex blunt, papillate, stigma corona-form, irregularly lobed; fruit globose or subglobose, 5–7 mm long.

### Key to the Varieties of *Myrsine grantii*

- Leaves mainly obovate, mainly less than 10 cm long .....var. *grantii*  
 Leaves mainly elliptic-oblong, mainly 9–13 cm long .....var. *toviensis*

### *Myrsine grantii* Fosberg & Sachet var. *grantii*

Glabrous shrub or small tree 3–6 m tall; cataphylls caducous, oblong to somewhat obovate, obtuse, 4–13 mm long; leaves coriaceous or subcoriaceous, broadly obovate to broadly oblong or elliptic, blades 4–13 cm × 3–6 cm, apex obtuse to rounded, base acute to obtuse, obscurely punctate beneath, more obscurely so above, veins moderately prominent above, less so beneath, somewhat irregular, 1.5–10 mm apart, depending on size of

leaf, anastomosing near margin, merging there into obscure secondary network but not forming a distinct marginal vein, margin slightly revolute, petiole 3–4 mm wide, 3–6 mm long (rarely, in no. 1789, leaves subsessile); flowers subsessile in few-flowered clusters, subtended by scale-like bracts, tetramerous; calyx 1.3–1.5 mm long, lobes ovate, about 1 mm long, acute to obtuse, usually with a large central dark spot or several dark lines; corolla lobes spreading, broadly elliptic or obovate, obtuse

or rounded at apex, somewhat narrowed at base, notably black-punctate, margins irregularly papillate, 1.5–2 mm long, tube 1 mm long; anthers about 1 mm long, curved, narrowly triangular sagittate, apex blunt, papillate; lower lobes rounded at bases; pistillode somewhat ovoid, somewhat over 1 mm long, stigma crown-like, spreading, irregularly undulately lobed; pistillate flowers not available; fruits globose or subglobose, about 5–7 mm diameter, black marked, subtended by spreading persistent calyx, crowned by scar of caducous stigma.

SPECIMENS SEEN.—Uahuka I.: s.l., *Whitney Expedition 1837* (BISH), 1789 (BISH).

Hiva-oa I.: Tenatinaci, 3620 ft [1100 m], *PES (M & A) 492* (BISH, type, NY (as *A&M*)); Kopaafaa, 2800 ft [800–900 m], *PES (M & A) HO 1008* (BISH, NY (as *A&M*)); Atuona-Feani trail, ridge crest, 1200–1300 m, *Sachet & Decker 1180* (US, P, UH, Fo). Fatuiva I.: Omoa, 700 m, *Brown 915* (BISH). Brown cited his 915 and *Mumford & Adamson 492* under his *Rapanea myricifolia* form *marquesensis*.

ETHNOBOTANY.—F. Brown cites *tiki* as the name on Fatuiva, presumably of his 915 collection. There is no other record of this name.

### *Myrsine grantii* var. *toviiensis* Fosberg & Sachet

*Myrsine grantii* var. *toviiensis* Fosberg & Sachet, Smithsonian Contr. Bot., 21:8, 1975.

Shrub to 4 m, branchlets 2–4 mm thick, brown; cataphylls obovate rounded at apex; leaves elliptic-oblong to slightly obovate, 9–13.5 × 4–5.5 cm or smaller, chartaceous to subcoriaceous, apex acute to obtusish in general outline, tip blunt to rounded, base from strongly contracted to cuneate or slightly attenuate to a very slightly winged petiole, 5–10 mm long, 2 mm wide, variably dark punctate and lineate beneath, less so but papillate above, especially when young, venation not prominent, less so beneath, main veins rather irregularly spaced, 12–15 (–17) on a side, usually curved downward (or divaricate) to join midrib, anastomosing near margin to form weak undulating submarginal vein, weaker veins in some intervals not reaching submarginal vein, network rather obscure; inflorescences reduced to very low scaly-bracted tubercles, bracts broadly ovate obtuse with erose brown glandular-ciliate margins; flowers 3–5 (–7) in a cluster, subsessile, calyx united about 1/3, lobes 4, ovate, obtuse to acutish, glandular-ciliate, dark

punctate-papillate, corolla in bud broadly ovoid, lobes about 1.5 mm long, ovate subacute, with black papillae dorsally, or these fused in lines, margins densely glandular-puberulent, in a band both inside and outside the actual margin; tube in bud extremely short; anthers or antherodes broadly sagittate, 1.5 mm long, blunt at apex, which is densely glandular-puberulent; pistil scarcely developed, style flattened, blade-like, ovate, less than 1 mm long; immature fruit on a pedicel 1.5 mm long, 1 mm thick, crowned with a disk-shaped coroniform stigma with several obscure lobes including an elongate 1–1.5 mm long subulate, angled one, caducous before full maturity; mature fruit globose, 5 mm in diameter when dry, crowned with a disk-like stigma scar, surface thickly beset with pale slightly elongate papillae, mixed with scattered black glandular dots.

Differs from var. *grantii* especially in the longer, narrower petioles, distinct submarginal veins in the thinner usually elliptic-oblong leaves with veins curving downward to join the midrib.

SPECIMENS SEEN.—Nukuhiva I.: "Plateau de Tovii, savane, 2 Mars 1973," *F. Hallé 2077* (US, type, P, MPU).

### *Myrsine nukuhivensis* Fosberg & Sachet

*Myrsine nukuhivensis* Fosberg & Sachet, Smithsonian Contr. Bot., 21:9, 1975.

Glabrous shrub or tree up to 10 m tall, branchlets 3–5 mm thick; cataphylls ovate strongly acuminate, up to at least 7 mm long; leaves thin coriaceous, elliptic to elliptic-oblong, large, up to 25 cm × 11 cm (mostly 15–20 × 6–8 cm, except *Hallé 2077a*, which has much smaller leaves, narrowly elliptic, or elliptic-lanceolate, 10–14 × 3–4 cm, petiole 9–12 mm), acute at both ends, apex blunt, blade somewhat black-punctate on either side, veins not very prominent, 5–15 mm apart, proximally curving downward to fuse with midrib, some weaker ones between, anastomosing distally into a looping submarginal vein from 3 to 10 mm from margin, network of 2–3 orders of prominence between veins, petiole 7–15 mm long, 2–10 mm thick when dried; dried fruits on pedicels 2–3 mm long, subglobose, to 6 mm long, somewhat narrower when dry (only present on no. 2214, on label said to be red, 1.5–1.7 cm diameter when



fresh; in no. 2180, said to be bright red, 2 cm, seeds 5 mm diameter).

**SPECIMENS SEEN.**—Nukuhiva I.: s. slopes of Mt. Tapuaooa, *Gillett 2180* (BISH, US); Toovii Valley near Tapuaooa shelter, 900 m, *Gillet 2214* (BISH, US, P); Oooumu Mt., 3500 ft [1100–1200 m], *PES (M & A) 581* (BISH, LeB); plateau de Tovii, savane, *Hallé 2077a* (US).

### *Myrsine tahuatensis* Fosberg & Sachet

*Myrsine tahuatensis* Fosberg & Sachet, Smithsonian Contr. Bot., 21:10, 1975.

Shrub 4 m tall, glabrous, young branchlets 5–7 mm thick with leaves crowded at intervals, more widely separated between the crowded portions, leaf scars transversely elliptical with a broad depression above; leaves obovate, sessile, up to 22 × 11 cm, apex obtuse to slightly bluntly acuminate, base somewhat auriculate or cordate, blade minutely and irregularly black-punctate, especially beneath, becoming stiff and subcoriaceous, main veins 14–22 on a side, visible above and beneath, irregularly placed, opposite to alternate, diverging at somewhat different angles, decurrent into the broad midrib, forking distally and anastomosing in arches that do not reach the margin, network obscure, especially beneath, older branchlets mottled light gray (possibly from lichens), bearing, below leaves, irregularly spirally disposed fascicles of 4–7 thick scaly divergent inflorescence branches up to 5 mm long and 2.5 mm thick. Flowers and fruits unavailable, except for a single detached fruit with mottled, dark and pale minutely pebbled surface, obviously immature—its sides rather collapsed, presumably subglobose when fresh, 3 mm long, on a thick short pedicel, 1.5 mm long, 1 mm thick, fruit subtended by a whorl of 3 thick calyx-lobes (another perhaps abortive), connate at base, broadly triangular, papillate, apex of fruit crowned by a short coroniform stigma of 3 or 4 lobes (one perhaps damaged or poorly developed), from an extremely low ring-like tube, lobes bluntly acuminate, irregularly incurved.

This species is represented by rather inadequate material but seems closest to *M. taitensis* Gray of Tahiti. It differs in larger, somewhat thinner, completely sessile leaves and in the conspicuously fasciculate (branched at base), much longer inflorescences, as well as in having the leaves tending

more to be crowded into intervals on the branchlets ("croissance rythmique nette" Hallé).

**SPECIMENS SEEN.**—Tahuata.: "Région du sommet de Tahuata," 17 Mar. 1973, *Hallé 2171* (US, type, P, MPU).

## PRIMULACEAE

Herbs, rarely shrubby; leaves opposite, whorled or basal, rarely alternate, simple, rarely dissected, exstipulate, often gland-dotted; flowers bisexual, usually actinomorphic, axillary or in bracteate racemes or umbels; calyx 4–9 lobed; corolla gamopetalous, 4–9 lobed, rotate to salverform; stamens 4–9, opposite corolla-lobes, rarely scale-like staminodes alternating with them, anthers 2-celled; pistil 1, ovary superior to half-inferior, unilocular, with free-central placentation, ovules few to numerous, style 1, stigma usually capitate; fruit a 5–10 valved capsule, or circumscissile.

A medium-sized family, almost cosmopolitan, relatively few in the tropics; one genus with one species in the Marquesas.

### *Samolus* L.

*Samolus* L., Sp. Pl., 171, 1753.

*Sheffieldia* J. R. & G. Forster, Char. Gen., 9, 1775; 17, 1776.

Herbs, rarely slightly woody; leaves alternate or crowded at base; flowers in a terminal raceme or corymb, 5-parted, calyx united, deeply lobed, persistent, corolla exceeding calyx, lobes longer than tube, stamens included, inserted on tube or throat of corolla, staminodia alternating with them, ovary partly inferior, fruit a 5-valved capsule; seeds angular.

Widespread mostly temperate genus of few species, mostly of wet, sometimes saline places. One species was found long ago in the Marquesas.

### *Samolus repens* (J. R. & G. Forster) Persoon

*Samolus repens* (J. R. & G. Forster) Persoon, Syn. Pl., 1:171, 1805.

*Sheffieldia repens* J. R. & G. Forster, Char. Gen., 9, 1775; 18, pl. 9, 1776.

Herb to 20 cm tall, several stems from root crown, sparsely or usually not branched, stems 4-angled, rugose, pustulate scurfy with minute pel-

tate white scales (or collapsed bladders?) pustules of stems (and especially of leaves) with pits in sum-mits; leaves alternate, abundantly scattered along stems, ascending, fleshy, oblanceolate, acute, pustulate and scurfy (as stems); about 1 cm long, lower part involute so as to appear like a tubular petiole, somewhat broadly attached, pits of leaves dark so leaf appears punctate dorsally, rosette leaves petio-late and spatulate; inflorescence a bracteate raceme, 1–2 cm long, 1–5 flowers, with thick receptacles, 5 ovate fleshy sepals, involute so as to appear subu-late and pustulate punctate when dry, corolla about 4 mm long, united in lower 1 mm or so, lobes obovate with rounded apex.

This species is known from New Zealand, Austra-lia, Easter Island, and temperate South America (Chile); not hitherto recorded from Polynesia, except Easter Island.

The description applies only to the Marquesan collection. Others are larger, with much longer leaves and longer inflorescences with more flowers.

SPECIMEN SEEN.—Marquesas: "Noukahiva," *s. coll. s.n.* (P).

## PLUMBAGINACEAE

Herbs or shrubs, leaves simple, alternate or basal, exstipulate, flowers 5-parted, calyx gamosepalous,

corolla gamopetalous, stamens 5, basally attached, ovary superior, 1-celled, the single ovule pendulous from a basal funicle, style 1 or 5, fruit an utricle or a circumscissile capsule.

A small family, almost cosmopolitan, with a few members commonly planted as ornamentals. One genus is found in the Marquesas.

### *Plumbago* L.

*Plumbago* L., Gen. Pl. ed. 5, 75, 1754 [=1753].

Suffrutescent herbs or shrubs, flowers in simple or branched short racemes, these often paniculate, calyx tubular, 5-toothed, covered by conspicuous very sticky stalked glands, corolla salverform, style filiform with 5 short stigmatic branches, fruit a cylindrical capsule, circumscissile near the base, upper part dehiscing into 5 valves.

A pantropical genus, chiefly found in dry or semidry areas or moderately wet coastal lowlands, with one indigenous species in the Marquesas and one cultivated species, *P. indica*. Another cultivated one, *P. auriculata*, is to be expected there. English "Leadwort" or "Plumbago."

### Key to Marquesan Species of *Plumbago*

1. Corollas 2 cm or less long, limb about 1 cm across, white, leaves tending to be ovate, acuminate ..... *P. zeylanica*
1. Corollas 2.5 cm or more long, limb 2 cm or more across ..... 2
  2. Leaves broadly ovate to elliptic, 3–5 cm wide, flowers red ..... *P. indica*
  2. Leaves obovate to rhombic, 2 cm or less wide, flowers pale blue or white ..... *P. auriculata*

### *Plumbago indica* L.

*Plumbago indica* L., Diss. Stickman, 24, 1754; Amoen. Acad., 4:133, 1759.

*Plumbago rosea* L., Sp. Pl., ed. 2, 215, 1762.

*Plumbago coccinea* Salisbury, Prodr. Stirp., 122, 1796.

Subshrub with slightly scandent striate stems; leaves ovate-elliptic decurrent into short petioles; flowers racemose, about 2.5 cm or more long, red.

SPECIMENS SEEN.—Hivaoa I.: Atuona, near sea level, in coconut plantation, PES (M & A) 406 (BISH, LeB), sterile.

### *Plumbago zeylanica* L.

*Plumbago zeylanica* L., Sp. Pl., 151, 1753.—F. Brown, Flora, 222, 1935.

Scrambling, semi-shrubby, leaves ovate to oblong, acuminate, flowers white, about 1 cm across.

Rare in the Marquesas.

SPECIMENS SEEN.—Eiao I.: top of high ridge, 600 m, rare, Jones 1542C (BISH).

Nukuhiva I.: Henry in 1916 (P); Hakaheu, "très rare," Herb. S.F.I.M. 133 (P); Hatiehu, 6 m, Brown and Henry 669

(BISH); Hakaui Valley, 50 m, *PES (M & A) 644* (BISH) (very large-leaved, sterile).

Uahuka I.: Hane-Hokatu trail, 30–40 m, *Decker 1374* (US). Hivaoa I.: 500 m, *Brown 5P* (BISH, 2 sheets); Hanamenu, *PES (M & A) 481* (BISH, LeB) sterile.

ETHNOBOTANY.—Marquesan names: *Kahauta* (*PES 644*), *Kohuima* (*S.F.I.M. 133*), *kuna* (*PES 481*), *kaha* (LeBronnec, ms, Uapou name). Said to have been used in medicine.

## SAPOTACEAE

Trees and shrubs, lactiferous; leaves usually alternately or spirally arranged, simple, entire, often coriaceous, stipules present or, usually, absent; flowers bisexual, solitary, fascicled or cymose, axillary

or on old wood; calyx with 4–12 lobes, united at base, variously arranged; corolla gamopetalous, deeply or shallowly 4–12 or more lobed, lobes imbricate, sometimes with appendages; stamens inserted on corolla, in several whorls, one series usually fertile and opposite the corolla lobes, the others alternating, these sometimes variously reduced to staminodia, anthers 2-celled; pistil 1, ovary superior usually 4–5 (sometimes less or more) loculed, each locule with a single ascending axile or sub-basal ovule, style 1; fruit a berry with 1–few large radially arranged seeds with lateral or basal scars.

A medium-size family, mostly tropical, very difficult taxonomically. No native species known in the Marquesas, two widely cultivated fruit trees.

### Key to Marquesan Genera of Sapotaceae

- Leaves crowded, not silky beneath, flowers solitary in upper axils, calyx in 2 series of 3, corolla 6-lobed, seeds elongate ..... *Manilkara*  
 Leaves scattered, coppery-silky beneath, flowers in axillary clusters, calyx and corolla each a single connate 5-lobed series, seeds hemispherical ..... *Chrysophyllum*

### *Chrysophyllum* L.

*Chrysophyllum* L., Gen. Pl., ed. 5, 88, 1754 [=1753].

Trees or shrubs, leaves scattered on rather flexuous branches (or crowded), tending to be coppery-sericeous; flowers in axillary clusters, pedicellate, usually with 5 sepals, connate at base, 5 petals, 5 stamens, no staminodia, ovary 5–12 locular, fruit a large berry, seeds compressed, radially arranged.

A pantropical genus, with one or two widely distributed species cultivated as ornamentals and for their fruit.

### *Chrysophyllum cainito* L.

*Chrysophyllum cainito* L., Sp. Pl., 192, 1753.

Tree to 10 m, branches slender, branchlets slightly zig-zag, densely coppery-sericeous, leaves not crowded, elliptic, usually 7–10 × 3–4 cm, or slightly larger, or on sterile shoots much larger, subcoriaceous, apex slightly acuminate, upper surface subglabrous, lower densely and conspicuously coppery-sericeous, veins widely divergent, 2–5 mm apart, anastomosing near margin into an undulat-

ing rather obscure submarginal vein, weaker veins between the main ones, petioles 1–1.5 cm long; flowers on pedicels up to 1 cm, in dense axillary fascicles of up to 20, pedicels and sepals densely coppery-sericeous, calyx 2 mm long united about half way, lobes concave, round, margins thin, scarious, corolla somewhat campanulate, 4 mm long, greenish white, lobed about 1/3 into broadly ovate rounded lobes, each with a coppery silky patch without, margins glabrous, glabrous within throughout, stamens very small, anthers broadly oblong, 0.7 mm long, attached by short triangular filaments to middle of bases of corolla lobes, ovary broadly ovoid, densely silky, stigma a lobed subsessile disk, fruit fleshy, purple, globose, about 6–10 cm diameter with about 8–10–(–12) radially arranged (in cross-section) somewhat compressed, sharp-edged semicircular seeds about 18 × 12 mm, brown, smooth, with a large elliptic, carinate ventral scar.

ETHNOBOTANY.—A few large trees cultivated in Atuona, brought from Tahiti where it is well known. English: star-apple; French name: *pomme étoile* from the star-shaped arrangement of seeds in the fruit pulp.

*Manilkara* Adanson

*Manilkara* Adanson, Fam. Pl., 166, 1763 [nom. cons.].

*Achras* L., Gen. Pl., ed. 5, 497, 1754 [=1753] [nom. rej.];  
Sp. Pl., 1190, 1753.

Trees, lactiferous, leaves usually leathery, tending to be crowded near ends of twigs, flowers pedicellate, axillary, sepals in 2 series of 3 (rarely 4), corolla tubular, 6-lobed; stamens opposite lobes, staminodia alternate with them, ovary 6–14 celled, seeds with narrow ventral scar.

A small pantropical genus, one species of which, *M. zapota*, is planted widely for its sweet fleshy fruit; its latex is the chicle of commerce.

*Manilkara zapota* (L.) van Royen

*Manilkara zapota* (L.) van Royen, Blumea, 7:410, 1953.

*Achras zapota* L., Sp. Pl., 1190, 1753.

*Achras sapota* sensu F. Brown, Flora, 223, 1935 [non L., Sp. Pl., ed. 2, 469, 1762].

Tree to 10 m or more, young parts reddish pubescent; leaves crowded at ends of branchlets, blades elliptic to somewhat oblong or rarely slightly obovate, to 10 × 4.5 cm, thin coriaceous, somewhat falcate, apex rounded to obtuse or acutish, base acute to obtusish, main veins widely divergent, 2–4 mm apart, obscure beneath, not conspicuous above, both sides finely but rather obscurely reticulate-venulose, petioles slender, 12–25 mm long, reddish pubescent, glabrate when older; flowers on pedicels 10–13 mm long, solitary in axils of uppermost leaves or of small oblong bracts, sometimes crowded at tips of stems, subtended by two minute bracteoles, pedicels and sepals densely brown tomentose, buds broadly ovoid, almost hemispherical, very obtuse, 6–7 mm long, 5 mm wide; sepals in 2 series of 3 (–4) each, 8–10 mm long, outer broadly ovate, narrowed somewhat to apex, inner broadly elliptic, obtuse, all densely tomentose without and near margins within; corolla glabrous, about 8–10 mm long, glabrous tube 6–7 mm long, lobes 6, narrowly ovate, apex rounded or tridentate, alternating with 6 petaloid staminodia, stamens 6, elliptic, 2 mm long, mucronulate on short filaments inserted opposite corolla lobes, a ring of dense wool surrounding ovary at base of corolla, ovary ovoid, densely

woolly, style thick, glabrous, somewhat exceeding corolla, stigma gummy, not much larger than style; fruit globose, brown, up to 7–8 cm across, skin dull, scurfy, flesh thick, dark honey-colored, very sweet, seeds up to 10–12, ellipsoid, 2–2.5 cm long, somewhat compressed, dark brown to black, smooth, scar lance-linear, ventral, not reaching apex of seed.

SPECIMENS SEEN.—Hivaoa I.: single tree on grounds of Compagnie Navale, Atuona, F. Brown (1935:223); Atuona, seen in garden in 1963 by Sachet.

ETHNOBOTANY.—Vernacular names: English, Sapodilla; French, *Sapotille*.

## OLEACEAE

Trees or shrubs, sometimes scandent, leaves opposite, rarely alternate or subalternate, simple or compound, exstipulate; flowers bisexual in usually few-flowered fascicles, cymes or panicles, sepals free, corolla gamopetalous (rarely absent), actinomorphic, lobes 4 or 5, valvate or imbricate, stamens 2, ovary superior, 2-loculed, with 2 or more ovules in a cell, style 1, stigma minute, fruit a capsule, berry, drupe, or samara.

A rather small, widely distributed family, containing the domestic olive and a number of ornamentals, including the lilacs, privets, and jasmines. Only one genus, *Jasminum*, in the Marquesas. The olive tree was imported into the Marquesas, and LeBrons (ms) mentioned seeing a large tree in Taiohae, probably in 1929 or 1930, which never bore fruit. There are no collections and no recent observations.

*Jasminum* L.

*Jasminum* L., Gen. Pl., ed. 5, 7, 1754 [=1753].

Vines or scandent shrubs; leaves usually opposite, unifoliolate or pinnately compound; flowers in few-flowered cymes; calyx funnel-form or campanulate, with 4–9 teeth; corolla salverform, lobes 4–10, imbricate, stamens included; fruit a geminate berry with 2 seeds in each half.

Old World genus with a number of cultivated ornamental species; several species known from the Marquesas, possibly one native.

### Key to Marquesan Species of *Jasminum*

1. Leaves compound, leaflets 3 or more..... 2
  2. Leaves trifoliolate ..... *J. didymum*
  2. Leaves pinnate, leaflets 5 or more..... *J. grandiflorum*
1. Leaves unifoliolate or apparently simple ..... 3
  3. Leaves subcordate to cordate, plant conspicuously pubescent, corolla lobes pointed..... *J. multiflorum*
  3. Leaves rounded to obtuse at base, plant glabrous or only very thinly pubescent..... 4
    4. Leaves with basal pair of veins very strong and ascending, appearing trinerved, corolla lobes linear-lanceolate, apices sharply acute or acuminate..... *J. laurifolium*
    4. Leaves without a strong basal pair of veins, corolla lobes more than half as broad as long, apices obtuse to rounded ..... *J. sambac*

#### *Jasminum didymum* Forster f.

*Jasminum didymum* Forster f., Prodr., 3, 1786.—F. Brown, Flora, 225, 1935.

This species was reported by Brown from the Marquesas and other islands, but he cited no specimens (nor indeed of the other species of *Jasminum* he discussed), and I have found none in the herbaria where I have worked. It may be a misidentification. The plant, however, is commonly found in other islands of southeastern Polynesia, and there are many collections from Tahiti, so it might occur in the Marquesas.

The following description is based on specimens from other islands of Polynesia. Liana with glabrous, sprawling, scrambling, or rarely somewhat twining stems, leaves trifoliolate, petioles 1–2 cm long, petiolules 4–15 mm, leaflets usually very broadly ovate or elliptic or oval, up to 9 × 5 cm, obtuse to acuminate, usually with 5 rather strong nerves from just above base, rather plinerved, base rounded to subcordate. Inflorescences loosely thyrsoid in axils, occasionally terminal on small branches, minutely puberulent, branches of thyrses dichasiod, the lateral pedicels branched with 2 flowers, central pedicel 3–5 mm, whole thyrses up to 13 × 5 cm, usually much smaller, with up to 4 internodes in main axis; flowers rather small for the genus, calyx campanulate to cylindric, about 3 × 2 mm, truncate except for minute blunt denticulation on margins, corolla salverform, tube about 5–7 mm long, lobes 4–7, suborbicular about 3 mm long, white, very fragrant; calyx in fruit somewhat enlarged and pedicel swollen, obconic; fruits 2, or one of them variously reduced or aborted, globose, 8–10 (–15) mm long, black.

Described from the Society Islands. The Tahitian name, *tafi*, means a twining liana, and is also used for other twiners.

#### *Jasminum grandiflorum* L.

*Jasminum grandiflorum* L., Sp. Pl., ed 2, 9, 1762.—F. Brown, Flora, 225, 1935.

*Jasminum officinale* L. var. *grandiflorum* (L.) Stokes, Bot. Comment. 1:21, 1830.

*Jasminum officinale* f. *grandiflorum* (L.) Kobuski, Journ. Arn. Arb., 13:161, 1932.

Loosely branched or scandent shrub, not twining, with long internodes, subglabrous, branches widely divergent to somewhat ascending; leaves pinnately compound, commonly 7–9 foliate, 5–10 cm long, terminal leaflet ovate, acuminate, 1.5–3.5 cm long, lateral ones smaller, obliquely ovate, obtuse to acute, mucronulate, petioles 12–20 mm; flowers in loose cymes, these terminal and on short lateral branchlets, the whole branch systems becoming open cymose-paniculate, terminal flowers in cymes on pedicels 5–15 mm long, the cyme-branches below them much longer, either bearing single bracteate flowers or very loose dichasia, sometimes only one lateral flower developing, sometimes one lateral pedicel proliferating monochasially, calyx tube cylindric-campanulate, about 1 mm wide and long, lobes 5, subulate-filiform, 5–12 mm long, slightly puberulent, erect or somewhat curved-spreading; corolla somewhat curved zygomorphic-salverform, tube slender, 10–17 mm long, subequal with limb, limb in bud fusiform, lobes 4–5, oval, 10–17 mm long, 5–10 mm wide, rounded to obtuse and mucronulate at apex, corolla white within, purplish maroon without, fragrant.

SPECIMENS SEEN.—Nukuhiva I.: low elevation, *Brown & Brown 710* (BISH).

Uapou I.: 10–15 m; houseyard, Hakahetau Village, ornamental, *Decker 2267* (US).

Uahuka I.: 1–10 m, village of Vaipae'e in canyon-like valley, ornamental, *Decker 1617* (BISH, US, P) (a form with unusually small flowers).

Hivaoa I.: Atuona, near sea level, cultivated, *PES (M & A) 215* (BISH, LeB) "vine, flowers yellow, fragrant." Atuona, cultivated, *PES Ex 215* (BISH).

ETHNOBOTANY.—Jasmine. *Pitae* is the Tahitian name for cultivated jasmines, also used in the Marquesas. Used for crowns (*PES 215, Ex 215*), used at funerals (*Brown & Brown 710*).

### *Jasminum laurifolium* Roxburgh

*Jasminum laurifolium* Roxburgh, Hort. Beng., 3, 1814 [nom. nud.]; Fl. Ind., 1:91, 1820.

*Jasminum angustifolium* var. *laurifolium* Ker, Bot. Reg., 7: t. 521, 1821.

*Jasminum nitidum* Auct. [non Skan], Kew Bull., 1898:225, 1898.

Shrub or climber, twigs appressed puberulent; leaves unifoliolate ovate to ovate lanceolate, 5–9 × 2–3.5 cm, apex strongly acuminate, bases rounded to acutish, glabrous above except for puberulence on main nerves especially beneath, a principal pair of veins from at or near base and strongly ascending make the leaf appear trinervate, 2–4 weaker veins on each side farther up, anastomosing into an obscure coarse network, petiole 4–6 mm long, strongly appressed pubescent, articulated at about the middle, the lower half persistent after the leaflet has fallen; flowers slightly fragrant, 1–7 in short terminal racemes, lower pedicels occasionally dichasioid-ramified, pedicels 1.5–2 cm long, puberulent, patent to ascending; calyx tube campanulate, to 3 mm long, lobes 6, filiform-subulate, sparsely puberulent, about 1 to 1.5 cm long, patent to ascending, straight; corolla salverform, white within, reddish purple without, tube 15–20 mm long, 1–1.5 mm thick, almost imperceptibly dilated in upper third, lobes 9–11 not or scarcely contorted in bud, buds sharply pointed, lobes about equaling tube, linear lanceolate, acute to acuminate, stamens and style included in corolla tube, stigma exserted; fruit unavailable.

A pantropically distributed cultivated species native to India. Cultivated in Tahiti where it is called *jasmin-étoile*.

SPECIMENS SEEN.—Uahuka I.: Vaipae'e, cultivated, 1–10 m, *Decker 1466* (US, P). Hivaoa I.: Atuona, planted in garden, 5 m, *Sachet 1286* (US).

### *Jasminum multiflorum* (Burman f.) Andrews

*Jasminum multiflorum* (Burman f.) Andrews, Bot. Reposit., 8:t.496, 1807.

*Nyctanthes multiflora* Burman f., Fl. Indica, 5, t. 3, f. 1, 1768.

Shrub, tending to be semiscandent, stems, petioles, under sides of leaf-nerves, and inflorescences densely pilose to tomentose, branches strongly divergent to somewhat ascending, terete, leaves unifoliolate, opposite, very broadly ovate to very broadly oblong, up to 5 (–7) × 4.5 (–5) cm, thinly pilose above and beneath, densely so on nerves beneath, main veins 3 or 4 on a side, apex acute to acuminate, rarely obtuse, base somewhat cordate, petiole 5–10 mm, straight to curved, inflorescences congested to subcapitate, terminal on lateral branchlets, densely pilose, 10–15 or more flowered, flowers blooming successively, fragrant, white, calyx densely pilose, calyx tube narrowly campanulate, about 2 mm long, lobes 6–7, subulate, pilose, 5–8 mm long, erect or strongly ascending, corolla salverform, tube 12–17 mm long, 1 mm thick at base, dilated upward to 2 mm, limb ovoid-fusiform, pointed in bud, lobes 8, ovate-elliptic, acute, 12–14 × 3–4 mm, patent; not seen fruiting.

Pantropical cultivated species said to be native to India (or Borneo?).

SPECIMENS SEEN.—Hivaoa I.: central Puamau, 100–200 ft [30–70 m], local, *Decker 556* (US, P). Atuona, cultivated in garden, *Sachet 1276* (US, P).

### *Jasminum sambac* (L.) Aiton

*Jasminum sambac* (L.) Aiton, Hort. Kew. 1:8, 1789.—F. Brown, Flora, 225, 1935.

*Nyctanthes sambac* L., Sp. Pl., 6, 1753.

Scandent shrub, stems, petioles and inflorescences sparsely to moderately woolly-appressed pilosulose, leaves unifoliolate, opposite to subopposite, larger ones (distally on branchlets) broadly elliptic, up to 9 × 5.5 cm, usually smaller, acute, or obtuse, mucronate at apex, obtuse to rounded at base, smaller ones tending to be very broadly ovate, subcordate or cordate at base; main veins 4 or 5 on a side, pinnate, no tendency for lower



pair to be stronger, opposite or somewhat alternate, petiole 2–5 mm, curved; flowers very fragrant, in racemes of 5 or in triads, terminal on short branchlets, bracts filiform, to about 8–9 mm, pedicels to 1 cm, calyx tube campanulate, about 2.5 mm long, 3 mm wide, lobes 9–10, subulate pilose, about 8 mm long, usually somewhat curved, corolla salverform, cream-white turning pink after falling, tube 10–13 mm long, 1.5 mm thick at base, very gradually dilated upward, limb in bud subglobose or broadly ovoid, rounded distally, lobes 6–9, usually 8, more in double-flowered forms, 12–13 × 7–10 mm, obtuse to usually rounded at apex.

Pantropical cultivated species, original home uncertain; not seen fruiting.

**SPECIMENS SEEN.**—Nukuhiva I.: Taiohae, low elevation, flowers white, very fragrant, introduced, not common, *Brown* 729 (BISH).

Hivaoa I.: Atuona, near sea level, vine, cultivated, *PES (M & A)* 303 (BISH, LeB, fragments).

**ETHNOBOTANY.**—Flowers still used for crowns, “*pitae*.”

## LOGANIACEAE

Habit various, latex none; leaves simple, opposite, joined at base by transverse ridges or interpetiolar stipules; inflorescences basically cymose, sometimes circinnate, reduced to fascicles, or elaborated into cymose panicles or thyrses; flowers 4–5 merous, calyx united at base or part-way up, corolla gamopetalous, lobes valvate or imbricate, stamens alternate with corolla lobes, attached in tube or throat, anthers 1–2-celled, longitudinally dehiscent, ovary usually superior, 2-loculed, ovules numerous, style 1 or 2 with a common stigma; fruit capsular or fleshy, usually septicidal, seeds usually many, rarely reduced to one.

A medium-sized mostly tropical family, seemingly very unnatural in its usual circumscription; as treated here somewhat reduced by removal of *Fagraea* to Gentianaceae. Few indigenous genera in oceanic Pacific islands.

### *Geniostoma* J. R. & G. Forster

*Geniostoma* J. R. & G. Forster, Char. Gen. 12, 1775; 23, 1776.

Shrubs or small trees; leaves penninerved, stipules thin, interpetiolar, forming a collar; flowers in

small axillary cymes or thyrses, 5-merous, sepals united below, with 5 lobes, corolla tubular or salver-form, lobes tending to be recurved, stamens inserted in throat, filaments very short, style rather short, stigma capitate, placentas fleshy, accrescent; fruit a septicidal capsule, separating into 2 halves exposing the mass of seeds embedded in the persistent red fleshy placenta, which dries into a hard mass.

An Indo-Pacific genus of many species, often very ill-distinguished; one in the Marquesas.

### *Geniostoma hallei* Sachet & Fosberg

*Geniostoma hallei* Sachet & Fosberg, Smithsonian Contr. Bot. 21:13, 1975.

*Geniostoma rupestre* sensu F. Brown, Flora, 227, 1935 [non J. R. & G. Forster, Char. Gen., 12, 1775; 24, 1776].

Shrub to 3 m tall, glabrous, nodes enlarged, internodes irregular in length, 4–20 (–25) mm long; leaves ovate to broadly elliptic, up to 7 × 3.5 (–4) cm, acute or rarely somewhat acuminate and mucronulate at apex, broadly acute at base, venation faint above, not prominent beneath, main veins (7–)8–9 (–10) on a side, not in regular pairs, bending slightly upward, becoming fainter and anastomosing near margin, network obscure, blade narrowed to a petiole 4–5 mm long, stipular collar truncate, 1.2–1.5 mm long very early rupturing down the interpetiolar sides; inflorescence a compound dichasium about 1–1.5 cm long, rather congested, twice trichotomous on a very short peduncle (very rarely, on the longest inflorescences, the central axis with an extra internode and the lateral dichasia each with a single extra outer pedicel from near base), a pair of ovate acuminate scale-like bracts at each ramification, the lowest connate, margins of bracts ciliate, pedicels 2–4 (–5) mm long, with or without 1–3 scattered scale-like ovate-triangular ciliate bracteoles; flowers white, foetid; calyx 2 mm long, lobed about 1/2 way, lobes triangular acuminate, ciliate, slightly imbricate at base, corolla about 3 mm long, tube 2 mm, throat densely bearded, lobes suborbicular, imbricate in bud, obtuse, spreading at maturity, inner basal surface crinkly pilose, margins strongly ciliate, edges papillate without, stamens just over 1 mm long, anthers broadly ovate or triangular to broadly oblong, slightly longer than broad, about 0.8 × 0.6 mm, apex rounded, connective conspicuous, fila-

ments very short, ovary broadly ovoid, stigma capitate, fleshy, sessile, constricted vertically and very slightly bilobed; fruit (immature) cylindric-fusiform,  $8 \times 3$  mm, slightly beaked, beak tipped by shrunken stigma.

**SPECIMENS SEEN.**—Tahuata I.: "Région du sommet du Tahuata," 17 Mar. 1973, *F. Hallé 2170* (US, holotype, P, MPU, isotypes).

Very closely allied to *G. astylum* Gray of Tahiti, differing in the smaller less oblong leaves, much smaller, more contracted inflorescences, which are not or scarcely thyrsoïd, in the more usual presence of bracteoles on the pedicels, in the somewhat acuminate much more ciliate calyx lobes, and in the corolla more densely bearded within.

Apparently very rare, one plant only seen by collector. A sterile specimen collected on Hivaoa, Feani, at 700 m, *F. Brown 1096* (BISH), may be the same.

## GENTIANACEAE

Herbs, shrubs, or trees, usually smooth, leaves opposite, simple; flowers 4- or usually 5-merous, calyx gamosepalous, lobed; corolla gamopetalous, lobes variously imbricated or plicate and usually contorted in bud; stamens 5, inserted on the corolla tube alternating with the lobes, anthers 2-loculed; pistil 1, ovary superior, 1 or 2 celled with parietal or axile placentation, ovules and seeds many.

Almost cosmopolitan, with only herbaceous members in temperate zones, herbs, shrubs, and trees in the tropics. One genus in the Marquesas (which is usually put in the Loganiaceae).

### *Fagraea* Thunberg

*Fagraea* Thunberg, K. Vetensk. Acad. Nya Handl. (Stockholm), 3:132, 1782.

Shrubs and trees with leathery leaves, stipules paired, intrapetiolar, connate with petiole at base, flowers in cymes, very fragrant, corollas campanulate to tubular salverform; fruit a many-seeded berry.

An Indo-Pacific genus, usually placed in the Loganiaceae, a family that seems artificial and better clarified by removing such extraneous elements as *Fagraea*.

### *Fagraea berteriana* Gray ex Benth

*Fagraea berteriana* Gray ex Benth, Journ. Linn. Soc. Bot., 1:98, 1857.—Drake, Ill., 238, 1892; Flore, 139, 1892.—F. Brown, Flora, 228, 1935.

Tree, cymes few flowered (buds up to at least 16), corolla white, turning creamy yellow, waxy, salverform, with 5 rounded to slightly obovate spreading to recurved lobes; anthers linear, basally inserted below summit of throat; ovary superior, cylindric, style thick-filiform, stigma bifid into two broad flat lobes; fruit orange to red, 3.5–5.5 cm long with juicy pulp and seeds embedded in it.

A widespread polymorphic species, with many varieties, extending from Queensland and New Guinea east to the Marquesas and north to Micronesia, carried around by Polynesians as an ornamental, so that its original range in Polynesia is very difficult to determine. Originally described from Tahiti. One variety known from the Marquesas differs from the Tahitian var. *berteriana* in the shorter corolla tube, 4–6 cm rather than 6.5–8 cm, and from another, undescribed Tahitian variety in its included rather than exerted stigma.

### *Fagraea berteriana* var. *marquisensis* Fosberg & Sachet

*Fagraea berteriana* var. *marquisensis* Fosberg & Sachet, Phytologia, 28 (5):471–472, 1974.

*Carissa grandis* sensu Jardin, Mém. Soc. Sci. Nat. Cherbourg, 5:314, 1857.

*Fagraea berteriana* sensu F. Brown, Flora, 228, 1935 [pro parte].

Glabrous tree, leaves obovate, blades up to  $20 \times 10$  cm, rounded at apex with a slight blunt acuminate, base cuneate, texture coriaceous, venation obscure, veins 10–12 on a side, petiole 1.2–4 cm long, free portion of intrapetiolar stipules 1.5–2 mm long, thick, blunt; inflorescence with up to 15 (–16) flowers; calyx lobes 5, broadly ovate to semicircular, obtuse to subtruncate, 5–8 mm long, margins scarious, corolla tube 4.3–6 cm long, somewhat dilated above into a slightly broader throat 1.5 cm long, the 2 cm below this transversally wrinkled within, lobes (4–)5 about  $2 \times 1.3$  cm, rounded to slightly obovate, spreading to recurved, waxy, very fragrant, white turning yellowish with age, stamens inserted at base of throat, filaments 1 cm long, anthers 1 cm long, broadly linear; pistil

included in corolla tube, ovary cylindric, 1 cm long, style thick-filiform, about 2.5 cm long, stigma 5 mm long, bifid into 2 somewhat spreading flat obovate lobes, rounded at apex; fruit a glossy orange to red berry, globose to subglobose or very broadly elliptic, 3.5–4.5 × 2.5–4.0 cm, not umbonate, not or only slightly beaked.

SPECIMENS SEEN.—Marquesas Islands: *Herbier S.F.I.M.* 135 (P).

Nukuhiva I.: *Barclay s.n.* (K); *Barclay 3217* (BM); *Quayle 1581* (BISH); Taiohae, 500 m, *Brown 393* (BISH); Hakaui, 1000 m, *Brown 467* (BISH); Taiohae Valley, 150 m, *PES (M & A) 597* (BISH, NY as *A&M*); *Tovii, F. Hallé 2062* (US).

Uapou I.: Poumaka, Haka Hetau Valley, *PES (A & M) UP-1* (NY, BISH, A).

Hivaoa I.: Puamau village, *Decker 918* (US, type); Atuona, *Brown 861* (BISH); Atuona, in small ravine at top of vil-

lage, *Sachet 1310* (US, P); *PES (M & A) 435* (BISH, NY as *A&M, LeB*); east of airstrip, *F. Hallé 2130* (US).

ETHNOBOTANY.—The Marquesans valued all flowers and fragrant plants, and *Fagraea* was one of their most important ones. The Marquesan name for this species is *pua*, which means flower. They were made into crowns and garlands, used to perfume coconut oil to rub over the body and in the hair. The red fruit called *kaupe* served in funeral rites. There were also some medicinal uses of the bark and other parts of the tree.

## APOCYNACEAE

Trees, shrubs, vines, and herbs usually lactiferous; leaves opposite or whorled, rarely alternate,

### Key to the Marquesan Species of Apocynaceae

1. Leaves mostly congested at tips of rather thick branches or alternate ..... 2
2. Leaves linear, flowers yellow or orange, campanulate, fruit a drupe ..... *Thevetia peruviana*
2. Leaves broader, flowers not usually yellow or orange, fruit various ..... 3
3. Leaves pale beneath, with prominent veins, inflorescence bracts inconspicuous, corolla funnel-shaped, fruit a pair of follicles (seldom seen) ..... *Plumeria rubra*
3. Leaves green beneath, veins not conspicuous, inflorescence bracts prominent, corolla salverform, fruit a drupe ..... *Cerbera manghas*
1. Leaves in well-separated pairs or whorls ..... 4
4. Leaves opposite ..... 5
5. Herbs, or slightly suffrutescent, less than 1 m tall, flowers showy, salverform ..... *Catharanthus roseus*
5. Shrubs or trees ..... 6
6. Leaves ovate to broadly elliptic, whitish and venulose beneath, flowers small, follicles elongate-linear ..... *Alstonia marquisensis*
6. Leaves elliptic, not strongly veined, green beneath, flowers showy, 2 cm across or wider; fruit (rarely developed) broader than linear ..... *Tabernaemontana divaricata*
4. Leaves whorled ..... 7
7. Leaves lance-linear or linear oblong, leathery, flowers showy, with scales in throat ..... 8
8. Flowers single nearly odorless ..... *Nerium oleander*
8. Flowers double, fragrant ..... *Nerium oleander* var. *indicum*
7. Leaves broader ..... 9
9. Plants scandent or twining ..... 10
10. Leaves less than 5 cm long, obtuse, flowers less than 5 mm across, fruit of one or more smooth drupes ..... *Alyxia stellata*
10. Leaves 8–10 cm or more long, acuminate, flowers 5–10 cm across, fruit a spiny capsule ..... *Allamanda hendersonii*
9. Trees or shrubs, not scandent; fruits paired drupes ..... 11
11. Leaves elliptic or oblong-elliptic, endocarps smooth or with large holes, dorsiventrally compressed ..... 12
12. Veins visible on both leaf surfaces ..... *Ochrosia nukuhivensis*
12. Veins obscure below, acuminate, buds pointed ..... *Ochrosia fatuhivensis*
11. Leaves broadly obovate-oval, or obovate-cuneate rounded or obtuse at apex, endocarps spiny, terete ..... 13
13. Leaves cuneate, drupes red, endocarp about 4 cm long ..... *Neiosperma brownii*
13. Leaves broadly obovate, not very cuneate, drupes yellow, endocarps 5 cm or more long [not definitely known from the Marquesas] ..... *Neiosperma oppositifolia*

simple, entire, exstipulate; flowers in cymes usually bracteate or solitary in leaf axils, calyx of usually 5 free sepals or at least deeply lobed; corolla gamopetalous, various in form, lobes 5 usually imbricate and contorted in bud; stamens inserted at top of corolla tube alternate with lobes, sessile or nearly so, connivent in a close ring around the stigma, 2-celled, pollen usually granular; pistil one but composed of two, rarely 3–5, separate carpels united at apex by a single style with a thickened variously shaped stigma (or clavuncle), ovary surrounded at base by a varied arrangement of glands or nectaries, each ovary with a single cell and usually several to many ovules; fruit usually a pair of dry or fleshy follicles or rarely drupes or berries, sometimes one by abortion, or rarely a capsule; seeds few to many, often comose or alate.

A fairly large, mostly tropical family, not very well represented in the indigenous Marquesan flora, but with a number of common tropical ornamental species, some of them in Marquesan gardens. There are 6 native species, 4 of them endemic, the rest widely distributed in the Pacific Islands.

### *Allamanda* L.

*Allamanda* L., Mant. Pl., 2:146, 1771.

Vine-like or shrubby, with whorled elliptic leaves, terminal cymes of showy campanulate-salverform flowers; calyx without glands, asymmetric; fruit a unilocular spiny capsule; seeds flat, winged or thick-margined.

An American genus with a number of species cultivated as ornamentals and widely planted in tropical countries. One species known to be grown in the Marquesas.

### *Allamanda hendersonii* Bull ex Dombrain

*Allamanda hendersonii* Bull ex Dombrain, Floral Mag., 5, t. 268, 1866.

*Allamanda cathartica* var. *hendersonii* (Bull ex Dombrain) Nicholson, Dict. 4:488, 1888.

*Allamanda cathartica* sensu F. Brown, Flora, 229, 1935 [non L., Mant. Pl. 2:214, 1771].

Glabrous scrambling climber, leaves elliptic, acuminate, 8 cm or more long, often in fours, corolla bright yellow, up to 10 cm across, tube and throat shorter than diameter of limb, lobes rounded; fruit very seldom seen.

One of the most popular and showy tropical ornamentals, often considered a variety of the smaller-flowered, more shrubby *A. cathartica* L., which has the leaves notably hairy beneath.

SPECIMENS SEEN.—Nukuhiva I.: Taiohae village, Decker 2149 (US); Brown 747 (BISH, not seen) appears to be this species also, from his description.

Uahuka I.: Vaipae'e village, Decker 1676 (US).

Hivaoa I.: Atuona, garden, PES (M & A) 407 (BISH), sterile; in garden, near sea level, PES Ex 407 (BISH); seen in gardens, Sachet in 1963.

Other species of *Allamanda* are commonly cultivated in Tahiti and may be expected in the Marquesas.

### *Alstonia* R. Brown

*Alstonia* R. Brown, Mem. Wern. Soc. 1:75, 1810 [preprint, nom. cons.].

Trees or large shrubs with opposite leaves, cymose panicles of small shortly tubular flowers, and paired, elongate, linear follicles; seeds with an appendage at each end. An Indo-Pacific genus including a number of important timber trees, two very closely related species in eastern Polynesia.

### *Alstonia marquesensis* Grant

*Alstonia marquesensis* Grant, in Fosberg and Sachet, Micronesia 8:46, 1972.

*Alstonia costata* sensu F. Brown, Flora, 233, 1935 [non (Foster) R. Brown, 1810].

Leaves broad, elliptic or oval, obtuse to acute, 9–13 × 3.5–7.5 cm, secondary veins 13–20 on a side, strong, connected at margin by a marginal vein that arches between adjacent secondary veins, glabrous or almost so; petiole about 4 cm long; corolla white 11–13 mm long, with lobes to about 6 mm long, obtuse to acute; style 2.5 mm long; follicles 19–29 cm long, 4–5 mm wide; seed 7–9 mm long, proximal appendage frequently forked.

This species is conspicuously variable in size and shape of leaves, size of cymes and length of follicles. It is perhaps too close to *A. costata* R. Brown of the Society and Cook Islands. A component of montane forest on high ridges on the larger islands.

SPECIMENS SEEN.—Marquesas Islands: s.l. Henry 6 (P).

Nukuhiva I.: Western side, above Uea Valley, near Baie Marquisienne, 150–200 m, Decker 2046 (US, P, BISH) (leaves

lance-elliptic, cymes full but loose); Tovi'i, *Quayle 1338* (BISH).

Uahuka I.: s.l. *Quayle 1753* (BISH), 1836 (BISH).

Hivaoa I.: "*Hauts plateaux*," Henry in 1919 (P); Atuona-Feani trail, 1200–1300 m, *Sachet & Decker 1174* (US, BISH, P); Feani, 900 m, *Brown 879* (BISH, type); "*route de Hanamenu*," 600 m, Henry in 1922 (P); north side of Mt. Temeitiu, *PES (A & M) 146* (UC, BISH as *M&A*) (a small leafed form); Atuona Valley, 1100 m, *PES Ex 140* (BISH); Teihuonui, 3400 ft [1000–1200 m], *PES (A & M) 498* (NY).

### *Alyxia Banks ex R. Brown*

*Alyxia Banks ex R. Brown*, Prodr. 469, 1810 [nom. cons.].  
*Gynopogon* J. R. & G. Forster, Char. Gen. 18, 1775; 35, t.18, 1776.

Twining vines or shrubs, leaves opposite or whorled, usually rather small, flowers in small axillary pedunculate cymes, corollas small, salverform, fruit a pair of subglobose carpels, each with a single stone or with two or more moniliformly arranged stones, the whole often reduced by abortion to one drupe or an end-to-end pair of drupes.

An important Indo-Pacific genus, centered in Malesia and New Caledonia, with at least one

representative in almost every high island in Polynesia and Micronesia.

### *Alyxia stellata* (J. R. & G. Forster) Roemer & Schultes

*Alyxia stellata* (J. R. & G. Forster) Roemer & Schultes, Syst. Veg. 4:439, 1819.

*Gynopogon stellatum* J. R. & G. Forster, Char. Gen., 18, 1775; 36, 1776.—Forster f., Prodr. 19, 1786.

*Alyxia stellata*, described from the Society Islands and Tonga, extends in various forms from at least as far west as New Caledonia to the Marquesas and Henderson Island. It is supposedly distinguished from *A. scandens* (also from Polynesia but not known from the Marquesas) by ternate vs. opposite leaves, but these occur too often on the same plant. It seems to be more reliably distinguished from *A. scandens* by considerably smaller flowers.

F. Brown (1935:230–231) placed all Marquesan material in his f. *marquesensis*, while admitting its variability. Three varieties are now recognized from the Marquesas.

### Key to the Marquesan Varieties of *Alyxia stellata*

1. Leaves ovate, subcordate to cordate at base.....var. *deckeri*
1. Leaves broadly elliptic to lanceolate, not at all cordate but obtuse to acute at base..... 2
  2. Leaves elliptic-lanceolate .....var. *fatuhivensis*
  2. Leaves broadly elliptic .....var. *marquesensis*

### *Alyxia stellata* var. *deckeri* Fosberg & Sachet

*Alyxia stellata* var. *deckeri* Fosberg & Sachet, Micronesica, 10:254, 1974.

Leaves broadly ovate, subcordate to cordate, cymes 4 cm long, flowers about 6 mm long, fruit segments subglobose, 10 × 12 mm, black.

Known only from high elevations of Hiva'oa, in cloud forest.

SPECIMENS SEEN.—Hivaoa I.: Atuona-Feani Trail, crest of ridge, 1200–1300 m, *Sachet & Decker 1151* (US, type, P, Fo, BISH, NY, K).

### *Alyxia stellata* var. *fatuhivensis* Fosberg & Sachet

*Alyxia stellata* var. *fatuhivensis* Fosberg & Sachet, Micronesica, 10:254, 1974.

*Alyxia stellata* f. *marquesensis* F. Brown, Flora, 230, 1935 [pro parte].

Leaves elliptic lanceolate, acuminate at apex, attenuate at base, up to 6 × 1.8 cm.

Known only from Fatuiva.

SPECIMENS SEEN.—Fatuiva I.: 600 m, *Brown 932* (BISH).

### *Alyxia stellata* var. *marquesensis* (F. Brown) Fosberg & Sachet

*Alyxia stellata* var. *marquesensis* (F. Brown) Fosberg & Sachet, Micronesica, 10:253, 1974.

*Alyxia stellata* f. *marquesensis* F. Brown, Flora, 230, 1935 [pro parte].

Shrubby vine; leaves in whorls of 3, coriaceous, broadly elliptic, venation obscure to visible, apex

somewhat acuminate but with tips rounded, bases rounded to acute, margins closely revolute; cymes about 1 cm long (to 2–2.5 cm in old fruiting specimens) 3–5 flowered; sepals triangular-ovate, pubescent, orange; corolla greenish yellow; drupes subglobose, about 1 cm long, black.

Most of the Marquesan material is rather uniformly like the above description. Found in forest from dry areas to cloud forest on wet crests.

SPECIMENS SEEN.—Nukuhiva I.: s.l. *Quayle 1323* (BISH), 200–1000 m, *Brown 562A* (BISH). Ooumu Mt., 3500 ft [1150–1250 m] *PES (M & A) 583* (BISH, NY as *A&M*, P). Spur of summit ridge, 1000 m, about 5 km SW of Tapuaoa shelter, *Gillett 2195* (BISH, US); *Tovii, Hallé 2090* (US).

Uahuka I.: s.l. *Quayle 1721* (BISH).

Hivaoa I.: Feani, 1200–1300 m, *Sachet & Decker 1151* (US). Vaiee Tanaeka Valley, 250 m, *PES (M & A) 428* (NY, LeB); Hanahoo, *PES (M & A) 362* (BISH, UC, LeB) (leaves to 8 cm long).

Mohotani I.: Momoei, 300 m, *PES (M & A) 538* (BISH, NY as *A&M*, LeB).

ETHNOBOTANY.—Species of *Alyxia* were as important in the Marquesas to make fragrant garlands (*hei*) as in Tahiti and Hawaii. The Marquesan name is *meie* (*meie papa* in Fatuiva). F. Brown mentions also *mehe* but this is probably a different plant, possibly *Morinda umbellata*. Jardin (1857: 297, 314) lists an *Alyxia* but, from the name (*katea*) cited, this is more likely a species of *Wikstroemia*.

### *Catharanthus* G. Don

*Catharanthus* G. Don, Gen. Hist. Dichl. Pl., 4:95, 1838.

*Vinca* L., Gen. Pl., ed. 5, 98, 1754 [=1753] [pro parte].

*Lochnera* Reichenbach, Consp., 134, 1828.

Herbs with opposite thin leaves, terminal corymbiform cymes of flowers, corollas salverform, fruit of two narrowly linear follicles becoming axillary as they mature.

A small genus native to South Asia and Madagascar, formerly considered a part of *Vinca* L., from which it differs in habit, position of inflorescence, and form of corolla. One species has become pantropical in cultivation and readily establishes itself in weedy disturbed places.

### *Catharanthus roseus* (L.) G. Don

*Catharanthus roseus* (L.) G. Don, Gen. Hist. Dichl. Pl., 4:95, 1838.

*Vinca rosea* L., Syst., ed. 10, 944, 1759.—F. Brown, Flora, 234, 1935.

*Lochnera rosea* (L.) Reichenbach, Consp. 134, 1828.

Erect herb, up to 0.5 m tall, leaves thin, oblong, obtuse, flowers showy, rose, white, or white with a red eye.

One of the most ubiquitous tropical plants, reputed to have important medical properties. Said to be originally from Madagascar. All three color forms planted in gardens in the Marquesas and frequently naturalized.

SPECIMENS SEEN.—Marquesas Islands: *Herbier S.F.I.M. 170* (P).

Nukuhiva I.: *Savatier 735* (P).

Uahuka I.: Vaipae'e village, *Decker 1662* (US); Hane Village, 10 m, *Decker 1951* (US).

Uapou I.: Hoho'i Valley, everywhere, mauve or white, *Lavondès 14* (US); west flank of Hakahetau, only one seen, 50–250 m, *Decker 2258* (US).

Hivaoa I.: Weedy roadside near beach at Atuona, 1–2 m, escaped from cultivation, *Sachet 1205* (US, P, BISH, UH); Atuona, escaped from cultivation, *Decker 399* (US, BISH, UC, P); among rocks of seashore (obviously escaped from cultivation), *PES (M & A) 122* (pink), *116* (white, red eye) (both BISH, LeB); *PES Ex 116* (BISH); Puamau, house yard, 100–200 ft [30–70 m], *Decker 538* (US); dry slopes between Nahoe and Eiaone, 100–300 ft [30–100 m], *Decker 617* (BISH, US); Hanamenu, near marsh back of beach, *Decker 1330* (US, Fo).

LOCAL NAMES.—*Perevai* (borrowing from the French, *pervenche*) (*Lavondès 14*), *tihapai* (*PES 122*). English: Madagascar periwinkle.

### *Cerbera* L.

*Cerbera* L., Gen. Pl., ed. 5, 98, 1754 [=1753].

Shrubs or small trees, leaves crowded at ends of branches, spirally arranged; cymes terminal, frequently with conspicuous pale green bracts; corollas salverform, throat narrow or somewhat dilated; fruit a pair of ovoid drupes, stones covered with spine-like fibers.

An Indo-Pacific genus, one species extending to Polynesia.

### *Cerbera manghas* L.

*Cerbera manghas* L., Sp. Pl., 1:208, 1753.—Jardin, Mém. Soc.

Sci. Nat. Cherbourg, 5:297, 314, 1857.—Jouan, Mém. Soc. Sci.

Nat. Cherbourg, 11:114, 1865.—F. Brown, Flora, 236, 1935.

*Cerbera odolla* [sic] sensu Drake, Ill. 233, 1892; Flore, 123–



124, 1892 [non *C. odollam*, Gaertner, Fruct., 2:193, t. 124, 1791].

Small tree, leaves elliptic, tending to be somewhat acuminate, bright, glossy green; inflorescence a corymbiform cyme with rather showy bracts, calyx conspicuous, corollas salverform, about 2.5 cm or more across, white with red "eye;" fruit usually reduced to one drupe, this large, oval, pendent on a cord-like peduncle and pedicel, dull purplish when ripe, obtuse or rounded to somewhat pointed at apex.

A strand plant, but extending onto higher ground, distributed from Indonesia to southeastern Polynesia, north to the Carolines. Often confused with *Cerbera odollam*, from farther west, in Malaysia and South Asia. The latter differs in having a shorter corolla with yellow eye and a swelling at the middle of the tube.

SPECIMENS SEEN.—Marquesas Islands: "très commun," *Herbier S.F.I.M.* 179 (P); *Dupetit Thouars* 54 (P, 3 sheets, US), 12 (P).

Nukuhiva I.: *Hombron* in 1841 (P); *LeBataud* 23 (P, 2 sheets); foothills of N. mt., 2500 ft [600–700 m], *Quayle* 1304 (BISH, 2 sheets); on ridge facing mts., 1200 ft [300–400 m], *Quayle* 1326 (BISH, 2 sheets); s.l., 1000 m, *Brown* 428 (BISH); 800 m, *Brown* 402 (BISH); 1 mi [2 km] from junction of Tovii trail and Taiohae trail, east part of plateau, *Decker* 200 (BISH, US, UC, P); Taiohae-Tapuaoa trail, 650 m, *Gillett* 2204 (US).

Uahuka I.: *Quayle* 1707 (BISH).

Uapou I.: *Quayle* 1069 (BISH); 1127 (BISH); Hoho'i Valley, *Lavondès* 19 (US); Pou Maka, *Hallé* 2039 (US).

Hivaoa I.: above Atuona, 500 m, *PES Ex* 3 (BISH); Atuona, above village, *Sachet* 1328 (US, P, BISH); Pouau, native forest, 500 m, *PES* 3 (LeB, fragments); between Nahoe and Eiaone, 100–300 ft [30–100 m], *Decker* 611 (US); above Hanamenu, ridge above Anatuakina cave, 1000–2000 ft [300–600 m] *Decker* 1247 (US, Fo).

Tahuata I.: *Hallé* 2158 (US).

ETHNOBOTANY.—The Marquesan name is *eva*. The fruit is very poisonous and the seed was formerly used to commit suicide or dispatch enemies. The latex (*epau*) is cooked and used as bird lime (*Lavondès* 19), and other parts of the plant have medicinal uses.

### *Neiosperma Rafinesque*

*Neiosperma* Rafinesque, *Sylva Tellur.* 162, 1838.

*Ochrosia* Auct. [pro parte, non Jussieu, Gen. Pl., 144, 1789].

Trees or large shrubs with whorled or opposite

leaves, cymes terminal, becoming axillary, of rather inconspicuous flowers; corollas salverform, unappendaged; fruit of two oval terete drupes with stones covered by spine-like fibers embedded in thin flesh; seeds flat, imbricate.

A small genus, Indo-Pacific in distribution, by many authors included in *Ochrosia* Jussieu.

### *Neiosperma brownii* Fosberg & Sachet

*Neiosperma brownii* Fosberg & Sachet, *Micronesica*, 8:49, 1972.

*Ochrosia parviflora* sensu F. Brown, *Flora*, 160, 1935 [pro parte including pl. 8B].

Glabrous tree 10 m tall; leaves opposite and in whorls of three, obovate-cuneate, obtuse, 5.5 × 14.5 cm, margins tightly revolute, veins prominent beneath, visible above, 17 pairs, 6–10 mm apart, with a weaker vein and an inconspicuous network between each two, petiole to 3 cm long; young cymes in axils of terminal whorl of leaves, 7 cm long, loosely 3 times trichotomous, scale-like bracts very reduced; mature flowers unavailable; fruits terete, 22–24 mm thick, possibly 4 cm long, flesh red, endocarp strongly fibrous-spinulose.

Known only from the type-specimen.

SPECIMEN SEEN.—Nukuhiva I.: 900 m, *Brown* 541 (BISH, type).

### *Neiosperma oppositifolia* (Lamarck) Fosberg & Sachet

*Neiosperma oppositifolia* (Lamarck) Fosberg & Sachet, *Micronesica* 8:48, 1972.

*Cerbera oppositifolia*, Lamarck, *Encycl. Meth.*, 1:62, 1783.

*Ochrosia oppositifolia* (Lamarck) K. Schumann, in Engler and Prantl, *Nat. Pfl.*, 4(2):156, 1895.

A sparsely branched umbrella-shaped tree, leaves large, obovate with rounded or obtuse apices, cymes paniculate open; corolla tube swollen near top, lobes white, narrow; fruit about 7 cm long, 3 cm thick, abruptly acuminate, yellow, or "rousseâtre" according to Lamarck, when ripe.

Not definitely known from the Marquesas, but likely to occur in coastal areas. F. Brown's (1935: 232) report of *Ochrosia parviflora* was based on a mixture of material of *Neiosperma brownii*, *Ochrosia fatuhivensis*, and *O. nukuhivensis*.

***Nerium* L.**

*Nerium* L., Gen. Pl., ed. 5, 99, 1754 [=1753].

Shrubs or small trees with milky sap; leaves whorled, linear-lanceolate, coriaceous; cymes terminal, corymbiform; sepals with glands inside at base; corolla with scales in throat, anthers appendaged at base and apex; fruit a pair of closely coherent linear follicles, seeds comose.

Native from the Mediterranean to South Asia, widely planted as ornamentals; violently poisonous when eaten, and even capable of producing a rash on contact.

***Nerium oleander* L.**

*Nerium oleander* L., Sp. Pl., 209, 1753.—Jouan, Mém. Soc. Sci. Nat. Cherbourg, 11:114, 1865.

Large bushy shrubs; leaves in whorls of 3 or 4, well separated on sparsely branched stems; flowers showy, in cymes, corolla with toothed or somewhat lacerate appendages in throat; follicles terete, drooping, 20 or more cm long; seeds with a tuft of hairs.

Native from the Mediterranean region to the Indus Valley, a component of broad-sclerophyll vegetation; cultivated in most warm countries. Two common cultivated varieties, apparently indistinguishable when sterile, proliferated into series of horticultural selections of cultivars, differing in color and number of corolla segments. Jouan saw several magnificent plants in Nukuhiva (Taiohae) around 1856. It is called *rorie*, a borrowing from the French laurier rose.

***Nerium oleander* L. var. *oleander***

Flowers essentially odorless, the corolla salverform, with short tube and lacerate scales in throat, white to pink or rarely red.

SPECIMENS SEEN.—Hivaoa I.: Puamau, house yard, 100–200 ft [30–70 m], Decker 571 (US) (white).

***Nerium oleander* var. *indicum* (Miller) Degener & Greenwell**

*Nerium oleander* var. *indicum* (Miller) Degener & Greenwell, Flora Hawaiiensis, 305; N.o.i. 7/25/'52.

*Nerium indicum* Miller, Gard. Dict., ed. 8, 1768.

*Nerium odorum* Aiton, Hort. Kew. 1:297, 1789.—F. Brown, Flora 235, 1935.

Flowers very fragrant, corollas usually double, the segments somewhat mucronate, usually a rich rose color, rarely white.

SPECIMENS SEEN.—Nukuhiva I.: s.l., Brown 950 (BISH) possibly this, but indeterminable; Taiohae village, bay front, Decker 2147 (US) (flower rose).

Uahuka I.: Vaipae'e village, school yard, Decker 1691 (US) (corolla rose).

***Ochrosia* Jussieu**

*Ochrosia* Jussieu, Gen. Pl., 144, 1789.

Shrubs and small trees, lactiferous; leaves whorled; cymes axillary or apparently terminal, several times dichotomous or trichotomous, branches may become elongate, zig-zag; corolla salverform, unappendaged, in bud slightly to strongly contorted; fruit of 2 divergent drupes, at least stones dorsiventrally compressed, surface smooth or with large cavities.

A large Indo-Pacific genus, mainly insular, extending from the Mascarenes to the Marquesas and Hawaii, with two endemic species in the Marquesas.

***Ochrosia fatuhivensis* Fosberg & Sachet**

*Ochrosia fatuhivensis* Fosberg & Sachet, Micronesica, 8:48, 1972.

*Ochrosia parviflora* sensu F. Brown, Flora, 22, 1935 [pro parte, non (Forster f.) G. Don, Gen. Hist. 4:99, 1838].

Glabrous tree 10 m tall; leaves whorled, oblong-elliptic, 3.5 × 7.5 cm, sharply acuminate, veins visible above, about 14 or 15 pairs, with weaker ones and network between; cymes terminal in 3's and single in upper axils, 2–3 cm long, twice trichotomous, flowers crowded or glomerate; sepals imbricate, ovate, obtuse, about 2 mm long; corolla in unopened bud cylindric, pointed, strongly contorted to left.

Possibly related to *O. compta* K. Schumann of Hawaii. Known only from the type-specimen.

SPECIMEN SEEN.—Fatuiva I.: Oia, 800 m, Brown 886 (BISH, type).

***Ochrosia nukuhivensis* Fosberg & Sachet**

*Ochrosia nukuhivensis* Fosberg & Sachet, Micronesica 8:48, 1972.

*Ochrosia parviflora* sensu F. Brown, Flora, 232, 1935 [pro parte, non (Forster f.) G. Don, Gen. Hist. 4:99, 1838].

Glabrous tree; leaves in whorls of 3, blades 5 × 15 cm, elliptic, tapering to both ends, veins visible on both surfaces, widely divergent, about 5 mm apart, with an anastomosing network between; petioles 3 cm long; young cymes to 2.5 cm long, loosely branched about 3 times; in bud only, sepals less than 1 mm high, very obtuse, wider than high, corolla in bud 7 mm long, tube 5 mm, lobes slightly twisted to left, fruit unavailable.

Probably related to *O. tahitensis* Lanessan.

Known only from the type-specimen.

SPECIMEN SEEN.—Nukuhiva I.: Mauu, Brown 432 (BISH, type).

### *Plumeria* L.

*Plumeria* L., Gen. Pl., ed. 5, 99, 1754 [=1753].

Shrub or small semideciduous trees with leaves and cymes clustered at ends of very thick branches; cymes corymbiform, corollas showy, salverform-funnelform, without appendages; anthers obtuse; fruit a pair of large rather woody divaricately divergent follicles.

An American genus, of which two species are among the commonest and showiest tropical ornamentals and are prized for their fragrant flowers. The less frequently cultivated *Plumeria obtusa* L., with dark green, leathery, obtuse leaves and white flowers, is found in Tahiti and may be expected in the Marquesas.

### *Plumeria rubra* L.

*Plumeria rubra* L., Sp. Pl., 209, 1753.

*Plumeria acutifolia* Poiret, Encycl. Method. Suppl., 2:667, 1811.

*Plumeria acuminata* Aiton f., Hort. Kew., ed. 2, 2:70, 1811.—F. Brown, Flora, 130:234, 1935.

Semideciduous small tree, with abundant white latex; leaves petiolate, elliptic, somewhat acuminate, pale beneath, with conspicuous veins, the secondary veins connected by a marginal vein that arches between them; flowers with oval spreading corolla lobes, very fragrant.

The "Frangipani," a pantropical ornamental with many color forms, from deep red through

pink, yellow, to white. Planted in gardens and in graveyards throughout the Pacific Islands.

SPECIMENS SEEN.—Nukuhiva I.: Low elevation, Brown 749 (BISH); Taiohae, low elevation, Brown 766 (BISH).

Uahuka I.: Vaipae'e Village, Decker 1678 (US) (flowers yellow and white, fragrant).

Hivaoa I.: Atuona Valley, Mauc, garden, 15 m PES (M & A) 453 (BISH) (flower white, yellow center). Atuona, seen in gardens and in graveyard on Gauguin's tomb, Sachet in 1963, flowers white and deep pink.

ETHNOBOTANY.—Flowers used in garlands and crowns. *Tipanie*, a rendition of frangipani or frangipaner, is the name in Tahiti and the Marquesas.

### *Tabernaemontana* L.

*Tabernaemontana* L., Gen. Pl., ed. 5, 100, 1754 [=1753].

*Ervatamia* (A. de Candolle) Stapf, in Dyer, Fl. Trop. Afr., 4(1):126, 1902.

*Tabernaemontana* sect. *Ervatamia* A. de Candolle, Prodr. 8:373, 1844.

Shrubs, leaves opposite, flowers in open cymose panicles; calyx small, glandular within at base; corolla salverform, contorted to left in bud, unappendaged; ovary of 2 carpels, many ovules in a locule; style filiform; fruit of 2 follicles, dry or fleshy, seeds arillate.

A rather large tropical genus, divided by some authors into a number of poorly defined or at least very similar genera. One or two species are commonly cultivated as ornamentals in tropical countries, one of these in Marquesan gardens.

### *Tabernaemontana divaricata* (L.) R. Brown ex Roemer & Schultes

*Tabernaemontana divaricata* (L.) R. Brown ex Roemer & Schultes, Syst. Veg. 4:427, 1819.—F. Brown, Flora, 234, 1935.

*Nerium divaricatum* L., Sp. Pl., 209, 1753.

*Tabernaemontana coronaria* (Jacquin) Willdenow, Enum. Hort. Berol. 1:275, 1809.

*Nerium coronarium* Jacquin, Coll. 1:138, 1786 [=1787]; Icon. Pl. Rar., 5, t. 52, 1781–1786 [=1787].

*Ervatamia coronaria* (Jacquin) Stapf, in Thistleton-Dyer, Fl. Trop. Afr. 4(1):127, 1902.

*Ervatamia divaricata* (L.) Burkill, Rec. Bot. Surv. India, 10: 320, 1925.

Shrub with rather elliptic glossy, dark green leaves, margins tending to be wavy, panicles small, calyx small with few glands; corolla large (in culti-

vated forms), white, 2–3 cm or more across, usually double, with almost no odor, follicles dry, oblong, with recurved beaks, rarely seen in cultivated plants.

Commonly planted; somewhat gardenia-like in appearance.

SPECIMENS SEEN.—Hivaoa I.: Atuona, shady garden, *Sachet* 1251 (US); *PES* (*M* & *A*) 405 (BISH, LcB); *PES* Ex 313 (BISH).

ETHNOBOTANY.—The Tahitian name *tiare moorea* (Moorea gardenia, or flower) is also used in the Marquesas.

### *Thevetia* L.

*Thevetia* L., *Opera varia* (Soulsby no. 9), 212, 1758 [nom. cons.].

Small tree densely branched, leaves alternate, corolla narrowly campanulate; fruit a soft broadly obovoid drupe with a trapezoidal flat stone.

A tropical American genus with one or two widely planted species.

### *Thevetia peruviana* (Persoon) K. Schumann

*Thevetia peruviana* (Persoon) K. Schumann in Engler and Prantl, *Nat. Pflanz.* 4(2):159, 1895.

*Cerbera peruviana* Persoon, *Syn. Pl.*, 1:267, 1805.

*Cerbera thevetia* L., *Sp. Pl.*, 209, 1753.

*Thevetia nereifolia* Jussieu ex Steudel, *Nom. Bot.*, ed. 2, 2:680, 1841 [as *nereifolia*].—A. de Candolle, *Prodr.*, 8:343, 1844.—F. Brown, *Flora*, 235, 1935 [as *nereifolia*].

Leaves linear, green on both sides, veins obscure; corolla bright yellow (or, in forma *aurantiaca*, salmon color), limb not strongly flaring.

The plant is considered poisonous and the seeds contain the powerful drug, thevetin.

SPECIMENS SEEN.—Nukuhiva I.: *Brown* 714 (BISH).

Hivaoa I.: Atuona, roadside near sea-level, *PES* (*M* & *A*) 335 (BISH, LcB), *PES* Ex 335 (BISH).

## ASCLEPIADACEAE

Vines, rarely shrubs or herbs, usually lactiferous, leaves usually opposite or whorled, simple, exstipulate, inflorescence often umbelloid, calyx united at least at base, corolla united, an elaborately developed corona frequently present, stamens 5, filaments usually connate, anthers closely united in a ring around the pistil, pollen fused in waxy masses

or pollinia (in subfamily Periplocoideae in tetrads); pistil of two free carpels united by a sessile stigma; fruit of two separate follicles, usually many seeded; seeds usually comose.

This important tropical family is represented in the Marquesas only by one introduced weedy species of *Asclepias*, sometimes planted as an ornamental.

### *Asclepias* L.

*Asclepias* L., *Gen. Pl.*, ed. 5, 102, 1754 [=1753].

Erect herbs with mostly opposite leaves, umbels terminal or subterminal, flowers rotate or broadly campanulate, with showy corona usually ornamented with hoods or horns, hiding the anthers, stigma fleshy, seeds with a conspicuous coma of hairs at one end.

A mostly temperate and subtropical genus, with one species widely dispersed in the tropics as an ornamental or weed.

### *Asclepias curassavica* L.

*Asclepias curassavica* L., *Sp. Pl.*, 215, 1753.—Jardin, *Mém. Soc. Sci. Nat. Cherbourg*, 5:297, 314, 1857.—Jouan, *Mém. Soc. Sci. Nat. Cherbourg*, 11:114, 1865.—Drake, *Ill.*, 235, 1892; *Flore*, 127, 1892.—F. Brown, *Flora*, 237, 1935.

Slender herb to 1 m tall, leaves thin, lanceolate, corolla reddish orange, coronas orange, follicles narrowly fusiform, smooth.

A Mexican species, widespread in the Pacific Islands, originally planted in gardens, now naturalized in disturbed weedy places. In the Marquesas it is occasionally seen, but is generally uncommon.

SPECIMENS SEEN.—Marquesas Islands: *Herb. S.F.I.M.* 20 (P).

Eiao I.: Common, *Jones* 1542A (BISH); plateau above Vaituha Bay, *Decker* 227 (BISH, US, UC, P).

Nukuhiva I.: *Savatier* 1975 (P); above Uea Valley, 150–200 m, *Decker* 2032 (US); Hakaui, *Brown* 771 (BISH).

Uahuka I.: Upper Ha'avei Valley, 200–250 m, *Decker* 1484 (US, BISH, Fo) Vaipae'e, 50 m, *Decker* 1762 (US); *Brown* 1818 (BISH); *Quayle* 1722 (BISH).

Uapou I.: *Brown* 1091 (BISH).

Hivaoa I.: Atuona, 800 m, rare, *PES* Ex 71 (BISH); Tepchi (above Hanamenu), exposed hillside, 600 m, *PES* (*M* & *A*) 420 (BISH); Natue Valley, 0–100 ft [0–30 m], *Decker* 1232 (US); Atuona, *Brown* 377 (BISH); Hana Japa, *Quayle* 1635 (BISH).

Fatuiva I.: Omoa, *Brown* 996 (BISH).

ETHNOBOTANY.—According to Jouan, this plant was introduced into Tahiti in 1839 and into the Marquesas (Nukuhiva) at the very beginning of the French occupation in 1842, and was spreading around Taiohae when he left in 1856. Jardin said the Marquesans made soft cushions from the seed plumes. Both give the name "*kirika*," a borrowing from the English "silk." Related names are *kirita* (Decker 1762), *puakirita* (Herb. S.F.I.M. 20), and *uru uru vaikirita* (PES Ex 71). Still other names: "*herbe de Mme Boivin*," LeBonnec (ms) and F. Brown (1935:237) cite also *vevai* from Fatuiva.

## CONVOLVULACEAE

Herbaceous or woody twiners or creepers, rarely erect herbs, shrubs or, very rarely, trees, frequently

lactiferous, but not copiously so; leaves alternate, frequently cordate, hastate or sagittate, simple but occasionally deeply divided or palmatifid, rarely pinnately divided or even apparently palmately compound; stipules none; calyx of 5 free sepals; corolla sympetalous, not ordinarily deeply divided; stamens 5, attached to corolla near base, or part way up tube; ovary superior, 2–4 celled with 4 basal ovules, style usually single, filiform, rarely 2 and branched; stigmas 1–3, thickened, fruit a 2-, 3-, or 4-celled dehiscent or indehiscent capsule, rarely fleshy, spongy, or corky, cells 3- or 4-seeded.

An important tropical family with a few temperate members; includes many widespread pioneers and weedy species, as well as tropical forest lianas.

### Key to Marquesan Genera of Convolvulaceae

1. Anthers coiled, pollen not spinulose, corolla funnellform with tube included in calyx, epicarp in fruit circumscissile, lid caducous, leaving a transparent circular window in endocarp showing locules with seeds.....*Operculina*
1. Anthers straight, pollen spinulose, corolla various ..... 2
2. Leaves black-punctate beneath, corolla light purple, 8–10 cm long, fruiting calyx spongy, tightly and completely enclosing fruit when mature.....*Stictocardia*
2. Leaves not black-punctate beneath, corolla, if 8 cm or more long, white, fruiting calyx opening at maturity and exposing fruit.....*Ipomoea*

### *Ipomoea* L.

*Ipomoea* L., Gen. Pl., ed. 5, 76, 1754 [=1753].

*Calonyction* Choisy, Mém. Soc. Phys. Hist. Nat. Genève, 6:441, 1833.

*Quamoclit* Moench, Meth., 453, 1794.

*Batatas* Choisy, Mém. Soc. Phys. Hist. Nat. Genève, 6:434, 1833.

Twining herbaceous to woody vines, rarely erect herbs; leaves simple, usually cordate, entire to deeply divided, petiolate; peduncles axillary; corolla narrowly funnellform or campanulate, regular to somewhat zygomorphic, entire to somewhat 5-lobed, plicate in bud, median lines heavy, intervening areas membranous; anthers included or exserted, straight; pollen grains spinulose; style 1, filiform, elongate, stigmas globose, 1, 2, or 3; fruit a capsule, dehiscent in 4 valves or irregularly.

A large pantropical and warm-temperate genus, found on almost all Pacific islands including the Marquesas; many of the species widespread and weedy, found on beaches and in disturbed places,

a few found in lowland forests. General English name: "morning-glory."

### *Ipomoea alba* L.

*Ipomoea alba* L., Sp. Pl., 161, 1753.

*Convolvulus aculeatus* L., Sp. Pl., 155, 1753 [non *Ipomoea aculeata* Blume].

*Ipomoea bona-nox* L., Sp. Pl., ed. 2, 228, 1762 [nom. illegit. superfl.].

*Calonyction bona-nox* (L.) Bojer, Hort. Maur., 227, 1837.—F. Brown, Flora, 238, 1935.

*Calonyction speciosum* Choisy, Mém. Soc. Phys. Hist. Nat. Genève 6:441, t. 1, f. 4, 1833.—Jardin, Mém. Soc. Sci. Nat. Cherbourg, 5:297, 315, 1857.—Delmas, in Dordillon, Dict. Marqu. 2:585, 1932 [sub *pohue*].

*Calonyction aculeatum* (L.) House, Bull. Torr. Bot. Club, 31:590, 1904.

*Calonyction album* (L.) House, Bull. Torr. Bot. Club, 31:590, 1904.

Extensive usually glabrous liana, lower stems thick but scarcely woody, frequently more or less beset with fleshy spine-like processes; leaves cor-

Key to Marquesan Species of *Ipomoea*

1. Leaves bilobed at apex..... *I. pes-caprae* ssp. *brasiliensis* 2
1. Leaves not bilobed at apex..... 2
2. Leaves pinnately dissected, flowers red, stamens exserted..... *I. quamoclit* 3
2. Leaves entire or lobed, stamens included..... 3
3. Sepals lanceolate, conspicuously acuminate, over 1 cm long ..... *I. indica* [not definitely known from the Marquesas] 4
3. Sepals oblong, elliptic, ovate, or orbicular, not long-acuminate ..... 4
4. Inner sepals broad toward apex, subtruncate..... *I. littoralis* 5
4. Inner sepals not conspicuously broad toward apex or subtruncate, usually oblong to orbicular or ovate ..... 5
5. Plant a creeper, leaves rather triangular in general outline, entire or variously lobed ..... *I. batatas* 6
5. Plant a twiner or climber, leaves more or less orbicular or triangular-ovate, strongly cordate ..... 6
6. Slender vine, sepals 3-4 mm long, corolla up to 2.5 cm long..... *I. obscura* 7
6. Coarse extensive vines or, if slender, leaves triangular-ovate and strongly acuminate, sepals well over 6 mm long..... 7
7. Leaves notably longer than wide, corolla 3-3.5 cm long, purple..... *I. tiliacea* var. *merremioides* 8
7. Leaves nearly orbicular, coarse vines, corolla well over 5 cm long..... 8
8. Stem usually with small fleshy spine-like processes, sepals strongly mucronate, seeds glabrous ..... *I. alba* 8
8. Stem usually smooth, sepals rounded at apex, at most very slightly mucronulate, seeds pubescent..... *I. macrantha*

date, entire to somewhat lobed; peduncles axillary, 1-several flowered, pedicels often thickened; flowers slightly zygomorphic, sepals strongly mucronate, 5-15 mm long, corolla white, open at night, closing as the day warms up, up to 15 cm long, funnellform but almost salverform, tube well exserted, stamens and styles somewhat exserted, stigmas 2, globose; capsule ovoid; seeds glabrous.

Pantropical, said to be of American origin, widely cultivated as the "moon-flower" and frequently naturalized; two doubtful collections from the Marquesas. Jardin's record of *Calonyction speciosum* is probably this species but his specimen (179) has not been seen. Delmas' description fits this species, which he reports to be rare and often confused with *I. macrantha*.

SPECIMENS SEEN.—Nukuhiva I.: F. Brown 543 (BISH).

Hivaoa I.: Makemake valley, 300 m, PES (M & A) 22 (BISH, LeB).

ETHNOBOTANY.—*Pohue* (PES 22) is a general name for morning-glory lianas in Tahiti and the Marquesas. Delmas says it applies to two species of *Ipomoea* besides *I. alba*. For the latter, he gives *pohue nui* (large *pohue*) or *pua mahati*, and *pohue mata nui* for the large white flower, and *mahati*

for the whole plant or the seeds used as a purgative. Jardin records this use and the name *mahati* for his no. 179 (not seen).

*Ipomoea batatas* (L.) Lamarck

*Ipomoea batatas* (L.) Lamarck, Tabl. Encycl., 1:465, 1791 [=1793].—Endlicher, Fl. Südseeinseln, 173, 1836.—F. Brown, Flora, 238, 1935.

*Convolvulus batatas* L., Sp. Pl., 154, 1753.

*Convolvulus chrysorrhizus* Solander ex Forster f., Pl. Esc., 55-56, 1786; Prodr. 89, 1786.—Endlicher, Fl. Südseeinseln, 173, 1836.

*Convolvulus edulis* Thunberg, Fl. Jap. 84, 1784.

*Batatas edulis* (Thunberg) Choisy, Mém. Soc. Phys. Hist. Nat. Genève 6:435, 1833.—Jardin, Mém. Soc. Sci. Nat. Cherbourg, 5:315, 1857.—Jouan, Mém. Soc. Sci. Nat. Cherbourg, 11:115, 1865.

Glabrous creeper with enlarged fusiform edible roots, thick stems, not twining; leaves with long petioles, blades more or less triangular, acuminate, more or less cordate to subtruncate at base, sides entire or variously cut or lobed; seldom seen flowering; peduncles umbellately or irregularly branched at summit into 1-4 short pedicels, bracts very small; sepals glabrous, oblong to oblong-ovate,

up to 8 mm long, obtuse to acute, mucronate; corolla light purple, campanulate, 3.5–4 cm long; stamens and style less than half length of corolla.

Pantropical in cultivation, generally agreed to be of American origin.

**SPECIMENS SEEN.**—Nukuhiva I.: Langsdorff cited by Endlicher (1836:173) (not seen, probably in W and/or LE). *F. Brown* 956 (BISH) (leaves entire), 955 (BISH) (leaves deeply dissected); 962 (BISH) (leaves deeply dissected).

Hivaoa I.: Atuona, sea-level, *PES* (*M* & *A*) 330 (BISH) (leaves shallowly 5-lobed); 327 (BISH) (leaves subcordate, entire, broader than long); *PES Ex* 327 (BISH) (leaves very wide, 5-lobed, lobes acuminate); Taiaka Papuae Valley, 50 m, *PES* (*M* & *A*) 438 (BISH) (leaves ovate-cordate, gradually long-acuminate with wide U-shaped basal sinus).

**ETHNOBOTANY.**—The general names for this species are sweet potato, patate douce, and, in the Marquesas, *kumaa* (Nukuhiva) or *umaa* (Hivaoa, *PES* 327, 330, *umaa papaoa*, *PES* 438). *F. Brown* (1935:239) gives some names of varieties. So does LeBonnec (ms) who lists from Nukuhiva: "*Kumaa Alierton*, *K. Dore*, *K. Pearson* (these three imported by Ch. Henry), *K. huahua moa*, *K. Pikino*, *K. Rapanui*, *K. Rurutu*, *K. tavaie*," obviously most of these imported from other islands. I was surprised, in 1963, to see very few plants of this species in Hivaoa and did not collect it. Decker (pers. comm.) observed that the very abundant rat populations of the islands made it unprofitable to plant sweet potatoes, unless they could be watched constantly. Other crops requiring less vigilance and hard work in clearing the land are planted in preference, even though the Marquesans like sweet potatoes very much.

While there is some evidence that the sweet potato was present on Easter Island before the arrival of Europeans, there is no conclusive proof that the same was true in the Marquesas. Indeed Mendaña, who discovered the islands in 1595, mentioned neither finding nor planting them there (Brand, 1971:357, 359). Identification of plant remains from an archeological site on Uahuka (Kirch, 1973:35) did not include sweet potato. This site, excavated by Sinoto and Kellum in 1964, was dated (Sinoto, 1966:295, 302) as about mid-12th century A.D. None of this proves that the sweet potato was not present, of course, and, at any rate, it was fairly common at the end of the 19th century. Jardin (1857:315) makes the interesting remark that in the 1850s it was beginning to be

cultivated by natives of Taiohae and Atiheu (Nukuhiva) not for their own use, but for sale to whalers. Jouan (1865:115), who left the Marquesas in 1856, records similar facts, but says that it is a recently introduced white variety, which is cultivated by the European residents for sale to whalers, a variety different from the generally yellow "Camotes" of Peru. Jardin gives the name *kumaa*, but mentions also two other varieties, *titau mei* and *titau kaikaha*. These, however, are varieties of yams, *Dioscorea*. *F. Brown* (1935:238) discussed uses and varieties, but some of his interpretations have been discounted by the foremost student of Pacific Islands sweet potatoes, Douglas Yen (1971:339). Yen (1974) collected 26 specimens from 5 islands in the Marquesas as part of his extensive study of the biology, genetics, and distribution of this species.

### *Ipomoea littoralis* Blume

*Ipomoea littoralis* Blume, Bijdr. 713, 1825 [=1826?].

*Convolvulus denticulatus* Desrousseaux in Lamarck, Encyl. Méth., 3:540, 1792.

*Ipomoea denticulata* (Desrousseaux) Choisy, Mém. Soc. Phys. Hist. Nat. Genève 6:467, 1833 [non R. Brown, 1810].

*Ipomoea forsteri* A. Gray in Mann, Proc. Amer. Acad. 7:195, 1867.—Drake, Ill., 243, 1892; Flore, 134, 1892.

*Ipomoea gracilis* sensu *F. Brown* et auct. plur. [non R. Brown, Prodr., 484, 1810].

Slender glabrous twiner; leaves broadly cordate, usually less than 5 cm across, sometimes somewhat trilobed, net-venation conspicuous; peduncles short, 1-several flowered, bracts minute, caducous; sepals unequal in width, outer oblong-elliptic, inner as broad as high, broadest at summit, slightly mucronate; corolla funnelform to campanulate, bright rose-purple, darker in throat, up to 4.5 cm long; stamens and style included, stigmas 2, globose; capsule glabrous, globose, about 9 mm in diameter; seeds black, glabrous.

Pantropical lowland species usually misidentified as *I. gracilis* R. Brown, a local North Australian species.

**SPECIMENS SEEN.**—Marquesas Islands: s.l. *Henry* 106 (P); *Herb. S.F.I.M.* 106 (P).

Nukuhiva I.: s.l. *Hombro* in 1841 (US); Taipi Vai, *Quayle* 1597 (BISH); Taiohae, 50 m, *Brown* 623 (BISH); *PES* (*M* & *A*) 611 (BISH).

Hivaoa I.: Atuona, *Brown* 1038 (BISH).

**LOCAL NAMES.**—*F. Brown* (1935:240) cites *pama-*



*ohe* and *Herb. S.F.I.M.* 106 bears the name *umaha papaoa*, which is really a variety of sweet potato and must be a misapplication.

### *Ipomoea macrantha* Roemer & Schultes

*Ipomoea macrantha* Roemer & Schultes, Syst. Veg., 4:251, 1819.

*Ipomoea longiflora* R. Brown, Prodr., 1:484, 1810 [non Humboldt & Bonpland ex Willdenow, 1809].

*Convolvulus tuba* Schlechtendal, Linnaea, 6:735-736, 1831.

*Ipomoea tuba* (Schlechtendal) G. Don, Gen. Hist., 4:271, 1838.

*Ipomoea glaberrima* Bojer ex Bouton, Hook, Journ. Bot., 1:357, 1834.

*Ipomoea bona-nox* [as *bona-noa*, sphalm.] sensu Delmas in Dordillon, Dict. Marqu., ed. 2, 2:585, 1932 [sub *pohue*].

*Ipomoea grandiflora* sensu F. Brown, Flora, 241, 1935 [non (Jacquin) Jackson, 1895, nec Lamarck, 1797, nec Roxburgh, 1814 (cf. Gunn, Brittonia, 24:153, 170, 1972)].

Extensive coarse glabrous twining liana, lower parts thickened but not very woody, in very dry situations forming a short very thick trunk, which annually produces herbaceous elongate stems, which die back during the dry seasons; leaves somewhat fleshy, or not, cordate orbicular, somewhat acuminate, to 15 cm across; peduncles 1-few flowered, cymose, pedicels thickened, or even somewhat turbinate; sepals orbicular, apex rounded, 15-25 mm long, accrescent and very thick in fruit; corolla white, to 10 cm long, with very long tube and flaring limb, opening at night; stamens and style included, stigmas 2; capsule globose or subglobose, to 2.5 cm long, enclosed by accrescent fleshy sepals, which later become reflexed and dry; seeds with black tomentum, long hairs on edges.

Pantropical species of strand and other lowland situations, climbing over thickets and trees; apparently uncommon in the Marquesas.

SPECIMENS SEEN.—Hatutaa I.: atop main ridge, 1300 ft [400-500 m], *Decker 351* (US); very common vine, 10-400 m, *Jones 1550* (BISH).

Nukuhiva I.: *Hombron* in 1841 (P).

Uahuka I.: 280-300 m, crest of ridge west of Vaipae'e Valley, occasional, *Decker 1703* (US, Fo); 40-60 m, ridge on east flank of Vaipae'e below Tahoatiki-kau crater, here common, *Decker 1748* (US, 2 sheets).

Uapou I.: Hoho'i valley, not far from the sea, near streams, *Lavondès 27* (US).

Hivaoa I.: Eastern Puamau, by trail approximately 200 m east of Catholic mission, occasional but conspicuous, *Decker 761* (Fo) sterile, poor specimen probably this species.

ETHNOBOTANY.—*Pohue*, the general name for

morning-glory vines is applied to this species (*Lavondès 27*). Delmas cites *pohue* or *pohueiti* (small *pohue*, by comparison with *I. alba*). F. Brown gives *mahati*, probably confusing this species with *I. alba*. *Piritai* (*Decker 1748*) should, according to Delmas, be applied to *I. alba*; he notes that the two are often confused.

Fruit used medicinally in some child's disease, and stems used formerly as jumping ropes (*Lavondès 27*).

### *Ipomoea obscura* (L.) Ker-Gawler

*Ipomoea obscura* (L.) Ker-Gawler, Bot. Reg., 3:239, 1817.—F. Brown, Flora, 240, 1935.

*Convolvulus obscurus* L., Sp. Pl., ed. 2, 220, 1762.

Slender twiner, almost glabrous to notably pilose; leaves broadly cordate, acuminate, up to 5 cm in diameter, with broad rounded basal sinus, margins subentire to finely crenulate, more or less ciliate, petioles slender, 2-6.5 cm long; flowers 1-several in pedunculate cymes, in each cyme one flower open at a time, peduncles 2-5 (or even 10) cm long, pedicels 1-1.5 cm, somewhat dilated upward; sepals 4-6 mm long, elliptic or elliptic ovate to oval or, in fruit, orbicular, the inner broader, mucronate; corolla campanulate-funnelform, flaring, 1.5-2 cm long, 1.5-2.5 cm broad, white or cream to sulfur-yellow, with dark purple center; stamens and pistil included; capsule subglobose, to 1 cm long, beaked, exerted from calyx, firm; seed 2.5 × 3.5 mm, plump, dark brown, sericeous tomentose.

SPECIMENS SEEN.—Nukuhiva I.: Eastern Taiohae, 0.5 km W old Fort Collet, 1-3 m, *Decker 2103* (US, BISH).

Uahuka I.: 10 m, sand dunes Hane Village, yard of hospital, common, *Decker 1961* (Fo).

Hivaoa I.: Miti taua'o'o, hill on SW corner of Puamau Bay, 100 ft [30-50 m], here common, *Decker 640* (US, P, Fo, BISH, UC); central Puamau valley, 5 m, waste places in uncleaned plantation, common, *Decker 820* (US, P, Fo, BISH); western Puamau, 250 ft [70-90 m], ravine in coconut plantation in upper paddock, occasional, *Decker 863* (US, P); central Puamau, 700 ft [300-400 m], mixed subsistence and copra plantation, mainly of trees, occasional, *Decker 1095* (US, P, UC).

### *Ipomoea pes-caprae* (L.) R. Brown

*Ipomoea pes-caprae* (L.) R. Brown in Tukey, Narrat. Exped. Zaire, 477, Mar. 1818.

*Convolvulus pes-caprae* L., Sp. Pl., 159, 1753.

Ssp. *pes-caprae* of this pantropical strand species is not found in the central Pacific, but mostly in the Indian Ocean area.

***Ipomoea pes-caprae* ssp. *brasiliensis* (L.)  
van Ooststroom**

*Ipomoea pes-caprae* ssp. *brasiliensis* (L.) van Ooststroom, *Blumea*, 3:533, 1940.

*Convolvulus brasiliensis* L., Sp. Pl., 159, 1753.

*Convolvulus maritimus* Desrousseaux in Lamarck, *Encycl. Méth.*, 3:550, 1789 [=1792].

*Ipomoea maritima* (Desrousseaux) R. Brown, *Prodr.*, 486, 1810.—Jardin, *Mém. Soc. Sci. Nat. Cherbourg*, 5:315, 1857.

*Ipomoea pes-caprae* sensu Jouan, *Mém. Soc. Sci. Nat. Cherbourg*, 11:116, 1865.—Drake, *Ill.* 244, 1892; *Flore*, 132, 1892.—Delmas in Dordillon, *Dict. Marqu.* 2:585, 1932 [sub *pohue*].—F. Brown, *Flora*, 240, 1935, and most Pacific authors [non (L.) R. Brown (vide supra)].

Prostrate, coarse, glabrous creeper, tending to form dense mats; leaves coriaceous, oblong or oval to broadly ovate, normally bilobed or at least deeply emarginate at apex, rounded to somewhat cordate at base, on stout petioles; peduncles erect, stout, with 1-several pedicellate flowers disposed in cymes; sepals elliptic to orbicular, outer ones narrower, obtuse, mucronulate, glabrous, up to about 1 cm long; corolla funnelform to campanulate, rose purple, darker in center, 3–5 cm long; stamens and style included, stigmas 2, globose; capsule globose, 12–15 mm high; seeds densely brown-tomentose, dull yellowish when the tomentum is worn off.

SPECIMENS SEEN.—Marquesas Islands: s.l., *Dupetit-Thouars* 8 (P); *Herb. S.F.I.M.* 79 (P).

Eiao I.: Plateau above Vaituha Bay, 1500 ft, *Decker* 206 (BISH, US, UC, P); windward slopes, *Jones* 1538 (BISH).

Nukuhiva I.: *Hombron* in 1841 (P); Uea Valley, strand above shingle beach, 2 m, locally very common, *Decker* 2028 (US); Taio Hae Bay, *Chapin* 748 (NY).

Uahuka I.: 2 m, strand behind sandy beach, Vaipae'e, very common, *Decker* 1494 (US).

Hivaoa I.: s.l., *Brown* 378 (BISH); Atuona, *PES* (M & A) 119 (BISH, LeB); near Atuona, 300 m, *PES* Ex 22 (BISH); central Puamau strand, just behind beach ridge of shingle, very rocky, very common and conspicuous, *Decker* 776 (BISH, US, Fo); Natue, to 100 ft [30 m], long uninhabited valley of east of Puamau near Mata Fenua, very common on strand, *Decker* 1228 (US); Atuona, *Chapin* 752 (NY); Atuona beach, forming large mats locally, *Sachet* 1212 (US, P, UH, Fo).

LOCAL NAMES.—One of three species called *pohue* by Delmas and on *Herb. S.F.I.M.* 79, *PES*

119; *pohue* and *paniaoe* by F. Brown, *neaho-paoué* (*Dupetit-Thouars* 8), *paniahoe* by Jardin and Jouan.

***Ipomoea quamoclit* L.**

*Ipomoea quamoclit* L., Sp. Pl., 159, 1753.

*Convolvulus pennatus* Desrousseaux in Lamarck, *Encycl. Méth.*, 3:567, 1791 [=1792].

*Quamoclit pennata* (Desrousseaux) Bojer, *Hort. Maur.*, 224, 1837 [as *pinnata*].

*Quamoclit vulgaris* Choisy, *Mém. Soc. Phys. Hist. Nat. Genève* 6:434, 1833.—Jardin, *Mém. Soc. Sci. Nat. Cherbourg*, 5:297, 1857.

Slender glabrous twiner; leaves pinnately divided into linear or filiform lobes; peduncles axillary, much longer than leaves, 1-several flowered, bracts nearly obsolete; pedicels 1–3 cm long, tending to be thickened toward apex; sepals oblong, obtuse to rounded, mucronate, corolla bright red, about 3 cm long, very narrowly funnelform, limb short but deeply lobed; capsule ovoid, obtuse at apex, glabrous, tending to split rather irregularly, valves thin, seeds glabrous, mottled brownish on black.

Pantropical species cultivated for its feathery leaves and small but bright red flowers.

SPECIMEN RECORDED.—Nukuhiva I.: Jardin 186 (not seen).

Jardin's record of *Quamoclit vulgaris* is probably this species, but his collection was not found in Paris. There are no other records, but the species should be looked for in the Marquesas.

***Ipomoea tiliacea* (Willdenow) Choisy**

*Ipomoea tiliacea* (Willdenow) Choisy in de Candolle, *Prodr.* 9:375, 1845.

*Convolvulus tiliaceus* Willdenow, *Enum. Pl.*, 203, 1809.

This species has previously been known from the Pacific only from Fiji and Tonga, where it was formerly usually called *Ipomoea fastigiata* (Roxburgh) Sweet. Otherwise it is tropical American. The Marquesan collections seem to represent a distinctive population with a few characters uncommon or absent in the variable, widespread American species.

***Ipomoea tiliacea* var. *merremioides* Fosberg**

*Ipomoea tiliacea* var. *merremioides* Fosberg, in Fosberg and Sachet, *Smithsonian Contr. Bot.* 21:14, 1975.

Glabrous climber but not very conspicuously twining, leaves thin, blades triangular-ovate, much longer than wide, up to  $10 \times 5$  cm, apex tapering-acuminate, base broadly and strongly cordate with a U-shaped sinus and rounded basal lobes, petioles slender, notably shorter than blades; inflorescence umbelloid in appearance but a condensed, once to twice ramified, cymose panicle on a long peduncle, to 13 cm, pedicels much longer than branches, these 1–16 mm, bracts minute, scale-like, sepals elliptic or elliptic-oblong to slightly obovate, about 8 mm long, obtuse, outer ones mucronate, corolla funnellform, 3–3.5 cm long, limb only slightly flaring, 2.5–3 cm wide, “rose-mauve,” stamens included in basal  $\frac{1}{3}$  of throat, unequal in length, shorter than style, anthers very narrowly sagittate, straight, 2–2.5 mm long, filaments subulate, glabrous apically, increasingly beset with short gland-tipped hairs below, pollen grains globose, very shortly spinulose; pistil 16 mm long, ovary subglobose, glabrous, style filiform, glabrous, stigma irregularly capitate, fruit globose, about 5 mm high, subtended by an entire disk, usually somewhat asymmetric, glabrous, beaked with persistent short style-base, this somewhat off-center, only one seed developed, this shot-like, 4 mm across, with 2 basal somewhat flattened areas edged on outer parts with sparse brown wool, scar light brown, obovate, surrounded by horse-shoe-shaped very low ridge, general seed-surface dull sooty brown.

The Marquesan specimens differ from those of Fiji and Tonga, as well as from the vast majority of the American ones, in being glabrous, in the much smaller much more funnellform, less flaring corollas, enlarging abruptly above the calyx, the abruptly short-mucronate rather than more gradually acuminate-aristate sepals, the usually much longer peduncles, and the entire, long-acuminate leaves rather than more or less orbicular, dentate or lobed.

SPECIMENS SEEN.—Hivaoa I.: Atikoua valley, above Atuona, 20–100 m, *Sachet 1300* (US, type, P, UH); upper Puamau-Atuona trail, 500–650 m, *Decker 1157* (US); Puamau-Eiaone divide, top of ridge, 300 m, *Decker 932* (US); Central Puamau, 800–1000 ft [250–350 m], common, *Decker 1071* (US, P, Fo, UC).

### *Operculina* Manso

*Operculina* Manso, Enum. Subst. Braz., 16, 1836.

Coarse twining vines; leaves large, cordate; cymes axillary, pedunculate, bracteate; sepals usually accrescent; corolla broadly funnellform to campanulate; stamens included, adnate to corolla tube, anthers becoming spirally twisted; style 1, included, stigmas 2, globose; ovary 2-celled, 2 ovules in a cell; fruit a capsule, the epicarp circumscissile, separating from the persistent transparent endocarp, this eventually breaking irregularly.

A small pantropical genus with two species in the Pacific, one native and widespread reaching the Marquesas.

### *Operculina turpethum* (L.) Manso

*Operculina turpethum* (L.) Manso, Enum. Subst. Braz., 16, 1836.

*Convolvulus turpethum* L., Sp. Pl., 155, 1753.

Coarse subglabrous twiner with angled to winged stems (Marquesan specimens weakly angled, not winged); leaves elongate triangular with slightly hastate base to orbicular cordate, with broad basal sinus, puberulent; peduncles with 1–3 flowers, pedicels becoming very thick, 2–4 cm long, bracts less than 2 cm long, early caducous; calyx lobes large, orbicular, apex rounded to obtuse, sharply mucronate, 2–3 cm long, sericeous, somewhat accrescent; corolla broadly campanulate, 5–6 cm long; capsule globose, about 1.5 cm long, or somewhat more; seeds black, glabrous.

Apparently very rare in the Marquesas, no definite localities known.

SPECIMENS SEEN.—Marquesas Islands: s.l., *Dupetit-Thouars 20* (US). Nukuhiva I.: *Henry 57* (P).

LOCAL NAME.—*Pania oke* (*Dupetit-Thouars 20*).

### *Stictocardia* Hallier f.

*Stictocardia* Hallier f., Bot. Jahrb., 18:159, 1894.

Large twiners; leaves glandular beneath; peduncles axillary, bearing cymes; sepals elliptic to orbicular, greatly accrescent and thickened in fruit; corolla funnellform-campanulate; stamens and style included, pollen spinulose; stigmas 2, globose; capsule completely enclosed by accrescent calyx, globose, 4-celled, the septa with transverse wings, wall thin, irregularly dehiscent leaving the septa and their wings enclosing seeds; seeds pubescent.

Pantropical, with one species in the Marquesas.

Differs from *Ipomoea* only in the glandular leaves, the thickened closed fruiting calyx and the structure of the capsule.

***Stictocardia campanulata* (L.) Merrill**

*Stictocardia campanulata* (L.) Merrill, Phil. Journ. Sci., 9 Bot., 133, 1914.—Delmas in Dordillon, Dict. Marqu. ed. 2, 2:586, 1932 [sub *puhipuhi*].

*Ipomoea campanulata* L., Sp. Pl. 160, 1753.

*Convolvulus tiliaefolius* Desrousseaux in Lamarck, Encyl. Méth., 3:544, 1789 [=1792].

*Stictocardia tiliaefolia* (Desrousseaux) Hallier f., Bot. Jahrb., 18:159, 1894.

Extensive but rather slender short-pubescent twiner. Leaves broadly ovate cordate with open sinus, apex slightly blunt-acuminate; peduncles 1-

rarely 3-, flowered, mostly shorter than leaves; sepals about 15 mm long, the inner exceeding outer, almost truncate, inner remotely ciliate, sepals enormously accrescent and becoming thick and spongy and completely enclosing the fruit; corolla delicate, lavender, narrowly campanulate but strongly flaring, 8–10 cm long, stamens and style included, fruiting sepals 4 cm long, closely investing capsule, capsule about 2.5–3 cm long, globose; seeds brown, shortly and sparsely sericeous.

Pantropical, widespread in the Pacific Islands.

SPECIMENS SEEN.—Eiao I.: side of ridge, 400 m, *Jones 1517* (BISH). Hivaoa I.: Makemake Valley, 300 m, *PES (M & A) 16* (BISH, LeB).

LOCAL NAME.—*Puhipuhi* (*PES 16*); also cited by Delmas as *aupuhi* in Uapou.

## Literature Cited

- Adamson, A. M.  
1936. Marquesan Insects: Environment. *Bernice P. Bishop Museum Bulletin*, 139:1-73.
- Aubert de la Rüe, E.  
1958. *Tahiti et ses archipels: Polynésie française*. 158 pages. Paris.
- Brand, D. D.  
1971. The Sweet Potato: An Exercise in Methodology. Pages 343-365 in Carroll L. Riley, J. Charles Kelley, Campbell W. Pennington, Robert L. Rands, editors, *Man across the Sea: Problems of Pre-Columbian Contacts*, Austin, Texas, and London.
- Brigham, W. T.  
1900. An Index to the Islands of the Pacific Ocean. *Bernice P. Bishop Museum Memoir*, 1:85-[256]. [Also issued in 1900 as separate 1-[172].]
- Brown, F. B. H.  
1931. Flora of Southeastern Polynesia, I: Monocotyledons. *Bernice P. Bishop Museum Bulletin*, 84:1-194, plates 1-35.  
1935. Flora of Southeastern Polynesia, III: Dicotyledons. *Bernice P. Bishop Museum Bulletin*, 130:1-386, plates 1-9.
- Decker, B. G.  
1970. *Plants, Man and Landscape in Marquesan Valleys, French Polynesia*. 324 pages. Ann Arbor: University Microfilms 71-9790.
- Drake del Castillo, E.  
1886-1892. *Illustrationes Florae Insularum Maris Pacifici*. 7 fascicles, 458 pages, 50 plates. Paris.  
1892. *Flore de la Polynésie Française: Description des plantes vasculaires qui croissent spontanément ou qui sont généralement cultivées aux Iles de la Société, Marquises, Pomotu, Gambier et Wallis*. . . . 352 pages. Paris.
- Fosberg, F. R.  
1939. *Psychotria* (Rubiaceae) in the Marquesas Islands. *Notulae Systematicae*, 8:161-173.
- Fosberg, F. R., and M.-H. Sachet  
1966. *Lebronnecia*, gen. nov. (Malvaceae) des Iles Marquises. *Adansonia*, 6:507-510.  
1975. Polynesian Plant Studies 1-5. *Smithsonian Contributions to Botany*, 21:1-25.
- Grant, M. L., F. R. Fosberg, and H. M. Smith  
1974. Partial Flora of the Society Islands: Ericaceae to Apocynaceae. *Smithsonian Contributions to Botany*, 17:1-85.
- Jardin, E.  
1857. Essai sur l'histoire naturelle de l'archipel de Mendana ou des Marquises. 2<sup>e</sup> partie: Botanique. *Mémoires de la Société Impériale des Sciences Naturelles de Cherbourg*, 5:289-331 [reprinted and repaged, 1862].
- Jouan, H.  
1865. Recherches sur l'origine et la provenance de certains végétaux phanérogames observés dans les îles du Grand-Océan. *Mémoires de la Société Nationale des Sciences Naturelles et Mathématiques de Cherbourg*, 11:81-178.
- Jourdain, P.  
1970. Découverte et toponymie des îles de la Polynésie Française. *Bulletin de la Société des Études Océaniques*, 14(171):314-374.
- Kirch, P. V.  
1973. Prehistoric Subsistence Patterns in the Northern Marquesas Islands, French Polynesia. *Archaeology & Physical Anthropology in Oceania*, 8:24-40.
- Sachet, M.-H.  
1966. Mission aux îles Marquises. *Cahiers du Pacifique*, 9:11-13.
- Sachet, M.-H., and F. R. Fosberg  
1955. *Island Bibliographies*. 577 pages. Washington, D.C.  
1971. *Island Bibliographies Supplement*. 427 pages. Washington, D.C.
- Sinoto, Y. H.  
1966. A Tentative Prehistoric Cultural Sequence in the Northern Marquesas Islands, French Polynesia. *Journal of the Polynesian Society*, 75:287-303.
- Yen, D. E.  
1971. Construction of the Hypothesis for Distribution of the Sweet Potato. Pages 328-342 in Carroll L. Riley, J. Charles Kelley, Campbell W. Pennington, Robert L. Rands, editors, *Man Across the Sea: Problems of Pre-Columbia Contacts*. Austin, Texas, and London.  
1974. The Sweet Potato and Oceania: An Essay in Ethnobotany. *Bernice P. Bishop Museum Bulletin*, 236:1-390.







## Publication in *Smithsonian Contributions to Botany*

*Manuscripts* for serial publications are accepted by the Smithsonian Institution Press, subject to substantive review, only through departments of the various Smithsonian museums. Non-Smithsonian authors should address inquiries to the appropriate department. If submission is invited, the following format requirements of the Press will govern the preparation of copy.

*Copy* must be typewritten, double-spaced, on one side of standard white bond paper, with 1½" top and left margins, submitted in ribbon copy with a carbon or duplicate, and accompanied by the original artwork. Duplicate copies of all material, including illustrations, should be retained by the author. There may be several paragraphs to a page, but each page should begin with a new paragraph. Number consecutively all pages, including title page, abstract, text, literature cited, legends, and tables. The minimum length is 30 pages, including typescript and illustrations.

The *title* should be complete and clear for easy indexing by abstracting services. Taxonomic titles will carry a final line indicating the higher categories to which the taxon is referable: "(Leguminosae: Faboideae)." Include an *abstract* as an introductory part of the text. Identify the *author* on the first page of text with an unnumbered footnote that includes his professional mailing address. A *table of contents* is optional. An *index*, if required, may be supplied by the author when he returns page proof.

Two *headings* are used: (1) text heads (boldface in print) for major sections and chapters and (2) paragraph sideheads (caps and small caps in print) for subdivisions. Further headings may be worked out with the editor.

In *taxonomic keys*, for easy reference, number the taxa and their corresponding headings throughout the text; do not incorporate page references in the key.

In *synonymy*, use the long form (taxon, abbreviated author, abbreviated journal or book title, volume, part if necessary, page, year) with no reference at the end of the paper under "Literature Cited" or use the short form (taxon, author, date: page) with a full reference at the end of the paper under "Literature Cited." Begin each taxon at the left margin with subsequent lines indented about three spaces. Within an entry, use a period-dash (.-) to separate each supplementary reference. Enclose with square brackets any annotation in, or at the end of, the entry. For *references within the text*, use the author-date system: "(Jones, 1910)" and "Jones (1910)." If the reference is expanded, abbreviate the date: "Jones (1910: 122, pl. 20: fig. 1)."

Simple *tabulations* in the text (e.g., columns of data) may carry headings or not, but they should not contain rules. Formal *tables* must be submitted as pages separate from the text, and each table, no matter how large, should be pasted up as a single sheet of copy.

Use the *metric system* instead of, or in addition to, the English system.

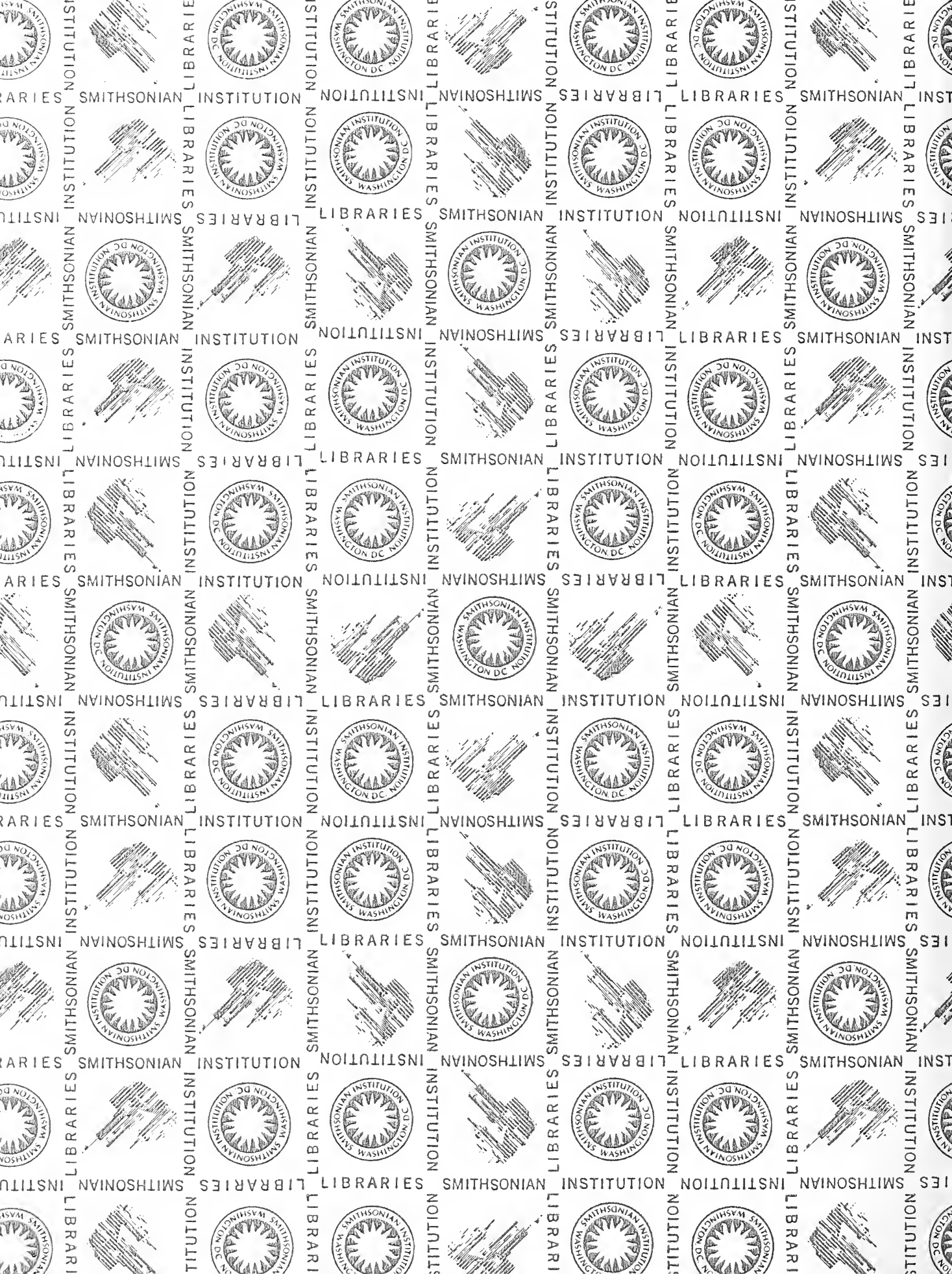
*Illustrations* (line drawings, maps, photographs, shaded drawings) can be intermixed throughout the printed text. They will be termed *Figures* and should be numbered consecutively; however, if a group of figures is treated as a single figure, the components should be indicated by lowercase italic letters on the illustration, in the legend, and in text references: "Figure 9*b*." If illustrations (usually tone photographs) are printed separately from the text as full pages on a different stock of paper, they will be termed *Plates* and individual components should be lettered (Plate 9*b*) but may be numbered (Plate 9: figure 2). Never combine the numbering system of text illustrations with that of plate illustrations. Submit all legends on pages separate from the text and not attached to the artwork. An instruction booklet for the preparation of illustrations is available from the Press on request.

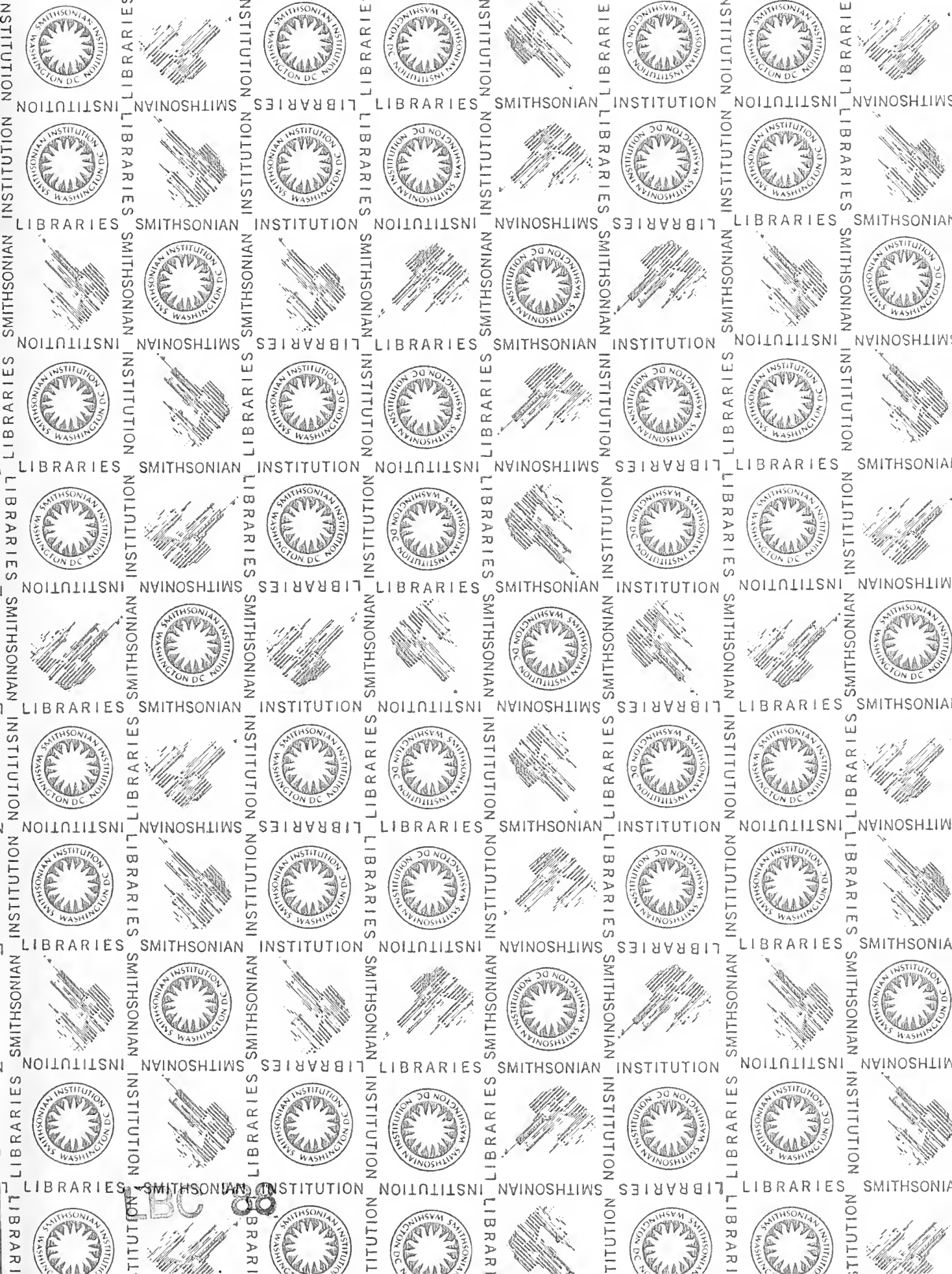
In the *bibliography* (usually called "Literature Cited"), spell out book, journal, and article titles, using initial caps with all words except minor terms such as "and, of, the." For capitalization of titles in foreign languages, follow the national practice of each language. Underscore (for italics) book and journal titles. Use the colon-parentheses system for volume, number, and page citations. "10(2):5-9." Spell out such words as "figures," "plates," "pages."

For *free copies* of his own paper, a Smithsonian author should indicate his requirements on "Form 36" (submitted to the Press with the manuscript). A non-Smithsonian author will receive 50 free copies; order forms for quantities above this amount with instructions for payment will be supplied when page proof is forwarded.











SMITHSONIAN INSTITUTION LIBRARIES



3 9088 01148 3831